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# Virtual patient educational programme to teach counselling to clinical pharmacists: development and proof of concept

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**ABSTRACT**

Pharmacist–patient counselling can benefit patients and optimise care, but appropriate training is required. A virtual patient (VP) tool to teach pharmacists non-vitamin K oral anticoagulant counselling was developed; the VP may be used for continuing professional development. The objective was to develop and show proof of concept of the VP. A cyclic development approach was adopted whereby the client, developers and a steering group informed VP design, content and aesthetic. This included formal and informal evaluation; ethical approval was not required. The VP received varied feedback. Positive feedback concerned the technology and the high-standard of animations. Negative elements concerned international VP use and differences in practice, also technological comments, regarding VP delivery and usability on various electronic devices. The VP was reported to be ‘valuable’ and realistic with high-quality animations. The steering group commented on VP’s clinical appropriateness, cultural relevance and usability. Areas highlighted for improvement were rectified during development, including the incorporation of printable feedback. European considerations concerned differences in culture and practice. The development process successfully developed the VP and the proof of the concept was demonstrated. This will inform future VP development; a large-scale VP evaluation is underway.

**INTRODUCTION**

When patients commence new medications, they require counselling by a health professional which can empower patients to adopt positive self-management, increase satisfaction and optimise care.<sup>1</sup> Pharmacists providing counselling need to be trained appropriately; Keele University has developed a virtual patient (VP) educational tool on the topic of non-vitamin K oral anticoagulants (NOACs) to treat atrial fibrillation (AF) (<https://www.keelevp.com/virtual-patient/newly-diagnosed-af-patient>) (figure 1).

The VPs uses a clinical decision pathway with corresponding visual effects to show an avatar responding to the user’s decisions. Personalised feedback is provided at the case conclusion to enhance counselling ability. The VP was developed with *Bayer AG* and is aimed at European pharmacists to improve practice. Many pharmacists are required to conduct continuing professional development, an anticipated VP purpose.

There are few anticoagulant and AF training or resources are available and most focus on facts

rather than real-life consultations<sup>2</sup>; no NOAC training using VPs has been identified. VPs have scarcely been investigated and they can vary remarkably in definition and design.<sup>3–5</sup> VPs are more widely investigated in medicine and with students rather than health professionals.<sup>6–8</sup> VPs have shown high levels of user satisfaction, usability and likeability,<sup>6,9</sup> as well as improvements in knowledge, confidence and counselling skills, all while being fun and engaging.<sup>8,10–12</sup> The potential to teach qualified healthcare professionals, including pharmacists, has been highlighted for the future.<sup>7,13</sup> This research aimed to develop a VP for pharmacists who conduct NOAC counselling.

**METHODS**

The VP was designed specifically around NOAC and AF educational needs. This study presents the VP development to demonstrate a proof of concept; ethical approval was not required. Within the tool, the patient presents to their pharmacy with a prescription for a NOAC: rivaroxaban. The case is intended to be as realistic as possible; every detail was considered and designed including the patient characteristics, script and the feedback provided. Intended learning outcomes were established followed by a script and animations.

Due to the intention to use the VP across Europe, a steering group of European pharmacists provided data for VP development, exploring the VP concept. Their brief was to advise on the case to ensure it was realistic, clinically accurate and appropriate for use. The technology-orientated VP team led a three-way cyclical approach<sup>14</sup> whereby the development team, client and steering group informed development and provided feedback. The VP uses computer-generated animated videos via HTML, CSS and Javascript resource accessing video renders.

The development of the VP was conducted through a blend of formal meetings, distance evaluation using formal forms and informal email feedback. Evaluation forms were a mixture of quantitative and qualitative questions. Feedback areas consisted of a number of VP elements: technological feedback, text (clinical content and style), spoken text, pictures/visual effects and case feedback. During development, feedback was deliberated by the involved parties to inform VP design; *Bayer AG* was regularly updated on development.



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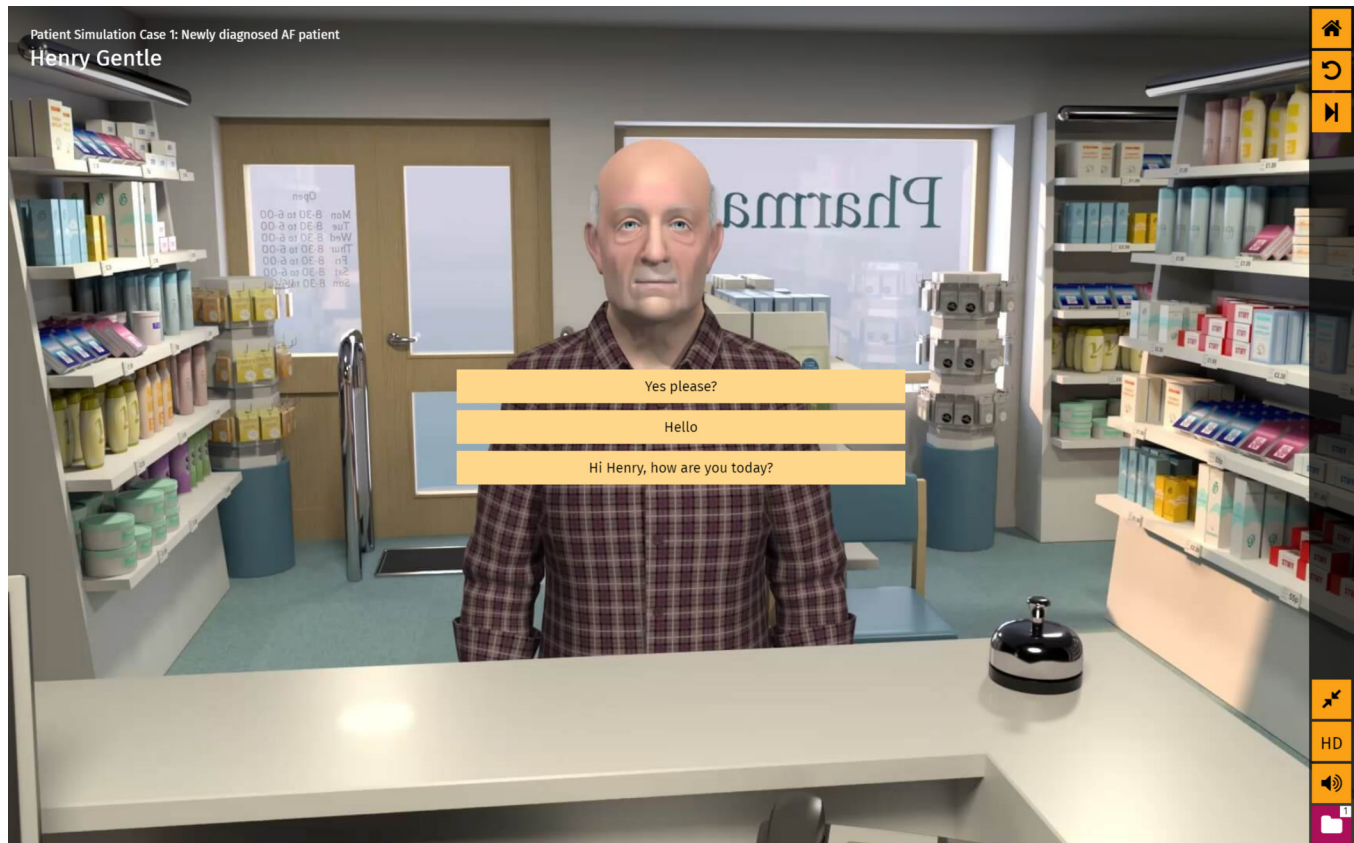


Figure 1 The virtual patient programme interface.

## RESULTS

A steering group evaluated the VP concept; they were from different European countries and had a range of experiences. They all trialled the VP; some trialled it on multiple types of electronic device. The VP received good feedback when the reviewers were asked if they liked the case, with 60% (n=5, response rate, n=6) of responses indicating a neutral or better answer. One response was negative; however, this individual trialled the VP on multiple devices. When they used a laptop/computer and smartphone rather than a tablet, their response improved from 'No, I don't feel comfortable using it' to 'Yes, I do like it a bit' and 'Yes, I do like it very much', respectively. This was controversial as some reviewers favoured the tablet version but others the smartphone or laptop versions. Interpretation of this is limited by the small numbers. One respondent highlighted that they would not undertake training on their phone but would choose more 'traditional methods'.

The VP received many positive comments but, as with a development process, elements were highlighted for improvement. Many negatives were technological, relating to the device being used, but positives included comments on the animations and case realism. The VP's potential for training newly qualified pharmacists was highlighted. One reviewer thought that the VP was too time intensive for regular use in practice. Similarly, multiple reviewers suggested more feedback concerning if what they had done within the case was correct or not. Nevertheless, the VP was stated to 'valuable'.

Some reviewers focused on pharmacy practice within one country and the implications for this on the VP design, rather than considering the VP broadly. For instance, in some countries including Germany, the use of a consultation room is uncommon and these users may not make use of the consultation

room within the case and thus would receive negative feedback. Another cross-cultural consideration concerned whether the patient should pay for their medication. Suggested improvements included the option for users to register on the website so that progress could be saved and returned to; this was subsequently adopted. As was the option to print or save a PDF of personalised feedback.

The steering group provided feedback on case iterations; this included the patient's expressions not fitting with script, and this was appropriately changed: changes to the virtual environment to make the pharmacy size more ambiguous and changes to clinical elements of the script, for example, whether Henry's co-medications would impact the case. There was a discussion around the use of Xarelto as the drug brand versus rivaroxaban as the drug name. Efforts were made to increase VP usability and make it 'user friendly'.

## DISCUSSION

Feedback suggested that the reviewers liked the VP concept but that delivery on different devices could be improved. Some data supported that the smartphone version was more usable than the other types, but one reviewer was opposed to using a mobile phone for learning. This was anticipated during development and the VP was designed to be available on various devices, suited to a range of personal preferences. This is in keeping with the intention for the VP to be accessible whenever required without technological boundaries. After design finalisation, the computer and mobile device versions were amended to look and function identically. This overcame many negative comments.

Most reviewers responded promisingly towards the concept and implications of the VP, provided there were delivery

improvements; reviewers were aware that the VP was an early iteration in development. Negative comments and technological suggestions were considered and the VP was amended as deemed appropriate by the development team. Increased user feedback was suggested with proposals of incorporating a pass/fail or percentage mark. The lack of this was an intentional design feature as there is not necessarily a 'correct answer' to the VP. It was hoped that this would empower participants to reattempt the case and explore alternative pathways, as well as to promote reflection, in keeping with pedagogy rationales of problem-based learning and theories of reflective learning through practice.<sup>15</sup> One reviewer struggled to appreciate that the VP was not to teach overt knowledge but to allow an opportunity to practice. It was highlighted that the VP may be useful for newly qualified pharmacists. This was an intended purpose of the VP, signifying that the VP was successfully designed around its brief.

As the VP was European, it was adapted due to differences in practice and culture. Regarding the use of a consultation room, it was made clear to users that the scenario is an ideal environment which includes a consultation room that should be made use of where appropriate. A further controversial topic concerned medication payment; this was removed from the case. In the UK, Henry is entitled to free medication; secondly, although payment is required in many countries, there may be price changes which could out date the case prematurely and finally, considering the main VP purpose was to develop counselling, taking payment was unessential. A similar discussion ensued regarding use of the brand and drug names, ultimately the use of the drug name (rivaroxaban) was decided on. Many other suggestions were incorporated into the VP including the option to print or save case feedback. This was added as written feedback may allow confirmation of learning and can be used to document continuing professional development.

The small number of reviewers was a limitation, this will be addressed in a wider study that is evaluating the usefulness, implications and integration of the VP, and this is ongoing. The respondents were from different countries and so were likely to have different opinions, this was purposive to establish views and cultural perspectives from multiple outlooks, although from individuals.

## CONCLUSIONS

The VP met the needs of the client and their application. Development was effective, in that a VP was created that is clinically accurate, realistic and useful, from the point of view of the steering group thus demonstrating proof of the VP concept ready for wider evaluation. These findings can inform future VP development and encourage the pharmacy profession to consider VPs as an alternative educational resource.

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**Disclaimer** Henry Gentle, the virtual patient character is not an actual patient. Any resemblance to real person living or deceased is coincidence.

**Competing interests** None declared.

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**Data sharing statement** There are no further unpublished data from this study available.

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