Secondly, stability over time was measured, where the ventilation rate was set for a period of 4 hours and measured against the device’s performance. This was repeated 3 separate times, for 4 hour periods, of 10, 20 and 30 breaths/min. The device allows for historical and real-time plotted graphs of RR, which were measured against the set CMV rate over the periods.

The device provided accurate and stable measurement of RR, including RR extremes in a controlled environment, using a human patient simulator under mandatory controlled ventilation.

Connection problems were identified between the sensor and hardware device during the trial, which were communicated to the product engineers.

Discussion The utilisation of simulation centre expertise and technologies by engineers, clinicians and others in the medical device field may expedite product design, identify design errors, increase end-user satisfaction and reduce patient harm.²

Conclusion Evaluating medical devices utilising simulation offers the opportunity to discover and correct design errors which may not become apparent until later, during clinical trials or post-market surveillance.

REFERENCES

P41 VIRTUAL PATIENT TECHNOLOGY TO TEACH PHARMACY STUDENTS NOAC COUNSELLING – QUESTIONNAIRE DEVELOPMENT VALIDATION AND PILOT
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Background Keele University has developed a virtual patient (VP) educational tool to teach pharmacists how to conduct non-vitamin K oral anticoagulant (NOAC) counselling. The VP’s use will be evaluated, but in order to do so, a validated data collection instrument is required. The aim of this study is to validate a data collection questionnaire for evaluating VP uses.

Summary of work The instrument is an online questionnaire in a pre- and post-intervention design which considers the VP’s usefulness, usability, and self-perceived ability changes. Ethical approval was obtained. Using a number of guidelines for instrument development the following steps were undertaken in the validation: literature review, questionnaire development, and pilot testing. The validation stage incorporated face and content validity, internal consistency testing using a Cronbach alpha test, and revisions.

Summary of results Minor grammatical and typographical amendments were identified and made throughout the instrument development process. The Likert scales were amended to be fully verbal and acquiescence bias was considered in questionnaire development, this helped assess internal validity. Cronbach Alpha results were significant (P=0.932 and P=0.872) and the questionnaire was usable from the perspectives of the participants. Content and face validity were incorporated into reviews of the study design and instruments, and both were deemed to be of a high level.

Discussion The Cronbach alpha test had significant results suggesting that the Likert scales of the questionnaire had a high level of internal consistency and in turn, reliability to be used in the wider study, meaning that the Likert items can be grouped together and used as a single overall score.¹ Many previous VP evaluations used some form of a questionnaire with many incorporating pre- and post-tests and satisfaction surveys, often using Likert scales. Most of these studies evaluated uses of various VPs and especially considered usability and satisfaction. Although such studies provided a basis for the use of questionnaires they had limited instrument validation. Multiple studies appeared to deploy self-designed instruments and did not discuss any validation or piloting. Many studies did include pilots but with a focus on the technology rather than the instrument.

Conclusion The questionnaire had a high level of validity so it can be used for a larger scale study. The Cronbach alpha test was significant establishing the questionnaire’s internal consistency and reliability. The questionnaire is therefore valid for use, following minor amendments, to evaluate a VP.

REFERENCES

P42 EVALUATING INTERPROFESSIONAL SIMULATION FOR PRE-REGISTRATION DOCTORS: FACTOR ANALYSIS OF THE HIDDEN CURRICULUM

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Background The General Medical Council recognises assistantships in preparing final year medical students for their first clinical job. These placements focus on shadowing junior doctors to help develop understanding of professional norms, system workings and to practice common skills. We aimed to investigate whether simulation could have an added benefit to this placement.

Summary of work Medical students were recruited during their assistantship period at a single district general hospital. A 21-item scale was designed by consensus to measure self-rated confidence in areas of practice considered common for junior doctors. Participants completed assessments at the start of their shadowing and before and after an interprofessional simulation session at the end of the placement. Non-parametric significance testing was used to assess individual changes in confidence. Factor Analysis was employed to examine construct validity of the scale.

Summary of results 25 students completed assessments. Average pre-placement confidence ranged from 20.5% to 57.5% across the 21 items. There was a significant increase in confidence after the shadowing in 18 of 21 items (p<0.03). Simulation provided an additional significant increase in confidence in 12 of 21 items, including the 3 items not increased during the shadowing alone. The items included in this group include ‘dealing with difficult relatives’, ‘managing acutely unwell admissions’ and ‘participating in a
cardiac arrest call. Factor analysis revealed that the scale lacks construct validity however it demonstrated that students consistently appear less confident dealing with on-call tasks compared to day-to-day tasks.

**Discussion** Simulation can provide experience useful for learning which is not necessarily provided by shadowing along. Pre-registration doctors' confidence appears to be higher in tasks felt to be day-to-day for junior doctors and less in on-call tasks. They also grouped items in a third category: dealing with difficult situations. Simulation increased the confidence in all areas and brought the item included in the latter category into alignment with day-to-day tasks. Factor analysis has a number of weaknesses but this should be considered a useful tool in the evaluation of simulation programmes of any size.

**Conclusions** Simulation, in addition to standard assistantship placements, can provide a further increase in confidence in tasks associated with being a junior doctor and can provide experiential learning not otherwise acquired.

**Recommendations** Simulation programmes should be incorporated into assistantship placements and statistical methods of evaluation should be considered when designing programme of any size.

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**Abstracts**

**P43  LONG TERM FOLLOW UP OF SELF-REPORTED CONFIDENCE LEVELS DURING A SIMULATION OVER 12 MONTHS**

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**Introduction** The literature is sparse on the effect of repeated simulation on the confidence levels of residents in achieving non-technical skills.

**Methodology** Ten first year anaesthesiology residents underwent a simulation scenario of difficult airway situation during general anaesthesia for Caesarean section. Pre and Post questionnaires, were collected for self-reported confidence levels on seven parameters. The residents were assessed based on a preformed check list and debriefed by two experienced anaesthesiologists. The same scenario was repeated at 6 and 12 months and confidence scores were collected.

**Results** The overall collated confidence scores showed significant increase from pre to post simulation at 0 and 12 months (p of 0.021 and 0.004 respectively) but not at 6 months. At 0 months, significant improvement between pre and post confidence scores were noted in the parameters of communication (p=0.016), recognising error at work place (p=0.031) and acknowledging limits of competence (p=0.016). At 6 months, there was no change between pre and post scores in any parameter. At 12 months, the significant improvement was noted again in communication (p=0.031) and also in ability to lead a team (p=0.031) and work as a team member (p=0.016). Up till 12 months, the two parameters where there was improvement but did not reach significance was in the confidence l to delegate and to manage a sick patient.

**Discussion** Learner specific training includes the understanding of the self confidence levels in the performance during a simulation scenario. The difference observed in the variables could suggest the hierarchical goals set by the residents to solve the problem. As per the conscious-competence model, acknowledging the limits of knowledge and a less complex communication skill preceded achievement of confidence in the more complex psycho-motor skill of leading a team and working as a team. Confidence in a more complex metacognitive knowledge like delegation of work would require more time.

**Conclusion** Debriefing during simulation for resident training should factor in the stages of competency hierarchy of the resident.

**Recommendation** Debriefing should be targeted to guide the residents through these phases of learning.

**REFERENCES**
