Description of the abcde*SIM* game

The computer-based simulation game was developed by Erasmus University Medical Center Rotterdam and Schola Medica. It was designed for residents to train cognitive emergency care skills through self-guided practice and feedback. The game offered an online emergency department with six cases, taking the form of virtual patients.

It game starts with a storyline in which the patient was presented to the player with brief information on the patients’ condition. The player then performed physical examination, aided with tools (e.g. a penlight symbolizes “look”, a stethoscope symbolizes “listen” and a hand symbolizes “feel”) which had to be used in a correct way to gather the correct information. The stethoscope would only provide breathing sounds if put on the right spot on the thorax, and different locations provided different lung sounds. The player could also order diagnostics (e.g. laboratory testing, ECG); results were presented after a certain timeframe. All sounds, pupil reflexes, lab results etc. had to be acquired and interpreted by the player and this information should lead to proper treatment of the patient with oxygen, infusion fluids, medication, etc. The (absence of) treatment lead to changes in the patients’ vital signs, real time displayed on a medical monitor (with sounds) to increase fidelity and give immediate feedback on the patients’ condition. The vital signs were generated by a high-fidelity model of human physiology. In addition to the feedback from the patient reactions, the game also provides feedback in the form of the assisting nurse who may correct the player on mistakes, such as the wrong level of oxygen for a specific oxygen mask.

The storyline ends with an explanation of how the patient faired after the players care, including narrative feedback on the actions and a score. The score depended on the number of correct decisions taken according to the ABCDE approach (e.g. put right oxygen mask on patient: 20 points) and the efficiency of actions (less minutes means more points). Each time a game-case was played, the condition of the patient could vary, depending on the interventions made. Players’ scores were presented in combination with peers’ scores at the end of each scenario and a ‘high score’ list was presented to stimulate competition. We estimated the game took 2-4 hours to study.