Strategy for Efficient Construction of Multimedia Case Simulations

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Background. Sophisticated interactive clinical case simulations for medical student education are expensive to purchase. Construction of simulations by individual faculty members has the advantage of customization, but development is time consuming. Clinicians often do not have the time to provide content expertise to a large library of simulations. An alternative approach to simulation development has been employed by clinical decision support systems that utilize the system's knowledge base to generate simulations. While these can be produced quickly, the resulting simulations may not be sufficiently sophisticated, flexible or modifiable. Their controlled vocabulary also may not be ideal for the particular instructional purposes. The present study describes an interinstitutional feasibility study designed to combine the strengths of a simulation shell that allows easy construction with generation of the basic content by a decision support system.

Method. The educational aim was to increase the amount of exposure students have to sleep disorders in a primary care setting. This required simulations of sleep disorders including narcolepsy and obstructive sleep apnea and other disorders that may present as excessive daytime sleepiness or insomnia. The decision support system used to generate the case data was QMR1 and the simulation program was Short Rounds.2 Short Rounds is a simulation authoring and presentation shell that reads clinical data from a structured text file and presents it in an interactive format that can be customized easily for a large variety of cases and teaching styles. The shell can be used to present text-only or text and multimedia simulations. The data were generated using the simulation function of QMR and entering either insomnia, excessive sleepiness, or nocturia as the focus for simulation generation. The QMR simulations included only the abnormal case data, with the remainder of the data presumed to be normal. QMR simulations for each of the foci were generated until ten usable QMR simulations for each complaint, representing a variety of diagnoses, were selected. The case data from the QMR simulations were manually entered into the Short Rounds construction shell, with minor changes to accommodate the Short Rounds format, and the new simulation was generated.

Results. The trial results showed that simulation generation can be accomplished quickly and easily by individuals not familiar with the Short Rounds program. QMR generated its simulations in a few seconds and each simulation could be reviewed for general appropriateness in less than a minute and either accepted, or discarded as inappropriate or repetitious. It took approximately three hours to produce the set of 30 appropriate simulations. Once a QMR simulation was selected as containing reasonable case data, data entry into the text file was accomplished in approximately a half hour. At that point, it was ready for final content review and could be imported into the Short Rounds program.

Conclusion. This study demonstrated the feasibility of using a clinical decision support system to generate basic case data in a short period of time, streamlining the construction of more sophisticated clinical simulation exercises.

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References
