an understanding of cognitive errors alone can prevent emergency physicians from making the same types of biases in thinking while working in the busy, unpredictable atmosphere of the emergency department. A cognitive errors algorithm taught to medical students and resident physicians may be a better approach towards promoting both comprehension of cognitive errors and how to utilize this knowledge when taking care of diagnostically challenging patients.

Objectives: The focus of this pilot study was to introduce a simple cognitive errors algorithm to 4th year medical students in a simulation-based course and evaluate whether it improved their performance in diagnostically challenging SIM cases and enhanced knowledge retention compared to students without prior cognitive errors training.

Methods: This was a prospective randomized study involving 10 4th year medical students enrolled in a simulation course on the management of common floor emergencies. Medical students were randomized using an online tool into group 1 (n = 5), which received an introduction to cognitive errors and use of a cognitive errors algorithm (see attached figure) for their simulation cases, or group 2 (n = 5), which performed their simulation cases before receiving an introduction to cognitive errors. Both groups were evaluated during their simulation cases for completion of critical actions utilizing a standardized checklist. Both groups completed a pre-test assessing their knowledge of the simulation case topics and a one-month delayed post-test assessing for knowledge retention. All medical students completed a survey about the course and their perceptions of cognitive errors in medicine.

Results: There was no change in average score from pre-test to delayed post-test in both groups. On review of the checklists of critical actions undertaken during the simulation cases, group 1 completed more critical actions than group 2 in 3 out of the 4 simulation cases and achieved the correct diagnosis in all of the cases, whereas group 2 determined the correct diagnosis in only 3 out of the 4 cases. 90% (9/10) of medical students surveyed were very interested in learning more about cognitive errors and planned to incorporate their knowledge of cognitive errors into their clinical management. All of the medical students in group 1 (5/5) agreed or strongly agreed that the cognitive errors algorithm was a helpful strategy for the diagnosis and management of patients.

Conclusions: Although there was no difference among the groups in terms of knowledge retention on multiple-choice tests, the group with cognitive errors training performed better at completing critical actions and achieving the correct diagnosis in a simulation setting. Overall, medical students were enthusiastic about the study of cognitive errors and believed that a cognitive errors algorithm could be a helpful diagnostic aid. Larger studies using different modalities such as video assessment or in-situ simulation to assess trainee performance and knowledge retention are needed.

Cognitive Errors Algorithm

1. Create differential
2. Select most likely or working diagnosis
3. Determine the worst-case scenario
4. Consider potential biases (anchoring, premature closure, context errors)
5. Make plan that addresses worst-case scenario and assesses for key illnesses within differential

10 Comparison of High-Fidelity Simulation versus Case-Based Discussion on Fourth-Year Medical Student Performance

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Background: Medical students are often prepared for clinical challenges with small group didactics featuring case-based scenarios. In recent years, simulation has also emerged as a valuable training tool. However, there is limited data on which format leads to improved student performance.

Objectives: We hypothesize that high-fidelity simulation allows for improved self-efficacy, knowledge, and clinical performance among fourth-year medical students (MS4s) on their emergency medicine (EM) clerkship, compared to traditional case-based discussion.

Methods: This study is a randomized, prospective, crossover study involving MS4s at an academic institution on their EM clerkship in the 2016-2017 academic year. At this institution, MS4s undergo 12 hours of small group didactics with case-based discussion prior to clinical shifts. At the start of the EM clerkship, MS4s were randomized into two groups: one group had high-fidelity simulation for the altered mental status (AMS) unit and case-based discussion for the chest pain (CP) unit; the second group had case-based discussion for the AMS unit and high-fidelity simulation for the CP unit. Thus far, 45 students have been randomized (Fig 1).

Students completed a self-efficacy survey, as well as a multiple-choice questionnaire (MCQ) featuring content from the CP and AMS units. They were also individually assessed on performance in an AMS and CP simulation scenario with a novel evaluation tool based on ACGME EM Milestones and AAMC Core Entrustable Professional Activities. This video data is still being reviewed.

Results: Students reported increased confidence

managing CP and AMS patients after both high-fidelity simulation and case-based discussion, with greater increases in self-efficacy with simulation ($p<0.05$, Fig 2). On the MCQ, the AMS simulation group outscored the CP group on AMS content by an average of 7.7% ($p<0.05$). The CP simulation group outscored the AMS group on CP content by an average of 2.1%; though this trend did not reach statistical significance, data is still being collected through the academic year.

Conclusions: Among MS4s undergoing their EM clerkship, high-fidelity simulation led to greater improvements in self-efficacy and knowledge.

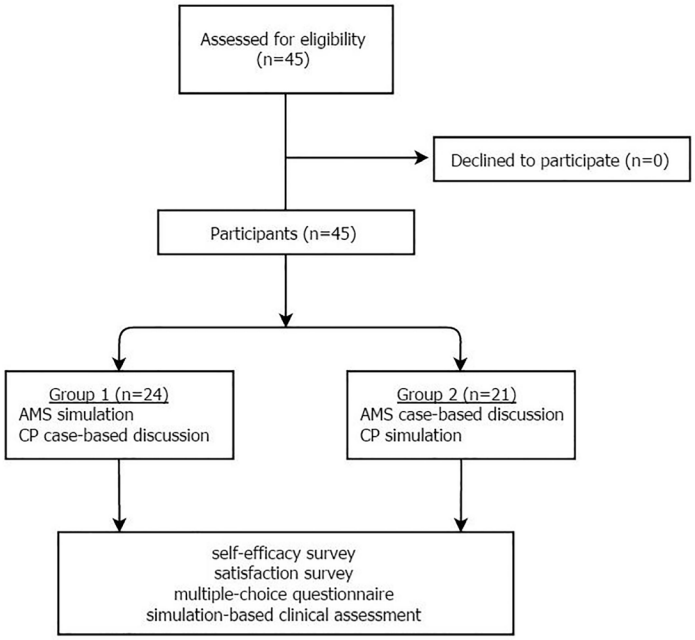

Figure 1.

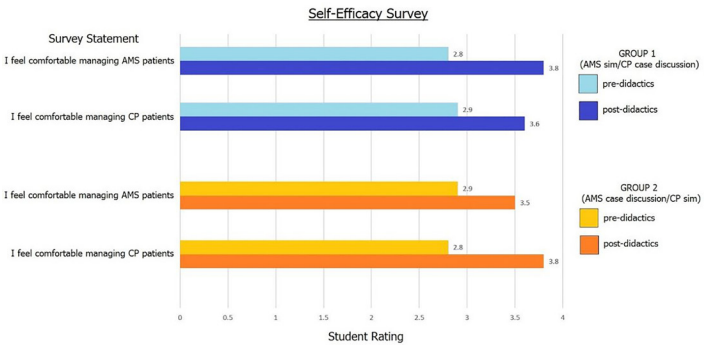

Figure 2.

11 Consulting with Game: How to Optimize Your Next ED Consultation

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Background: Emergency Medicine (EM) requires substantial communication with multiple specialties, 20%-40% of all patients have a consult during their stay. Communication is difficult in the chaotic and fast-paced EM environment. Poor communication and inadequate handoffs are associated with unfavorable patient outcomes, increased financial burden on hospitals, and litigation. Until recently, there has been little evidence regarding the optimal structure of consultations, or how to teach future physicians this skill.

Objectives: Present methods to optimize consultations in the emergency department including: structure and content of a good consult, how to teach this skill, how to prevent conflict, and what system factors are involved.

Methods: We completed a systematic review of the literature and performed a qualitative interview -based study within our own institution seeking to identify methods to optimize consultation, teach effective consultation skills, prevent conflict, and improve overall inter-department system factors.

Results: We identified 16 relevant articles incorporating consultations that have been published since the most recent systematic review in 2008. Seven focus on identifying the most important functional aspects of a consultation with two proposing standardized processes. Several (8) present methods and suggested timing to start formal education. Conflict prevention is reviewed in three, and six articles discuss systemic factors that influence consultations. The results from our qualitative interviews (figure 1) offer another guideline on how to optimize communication with a consultant.

Conclusions: The vast spectrum of Emergency Medicine makes a scripted consultation process difficult to develop. However, several standardized processes have been proposed such as the '5C's' and 'PIQUED'. The findings in our study solidify the content embodied in each of these methods. The literature supports initiation of structured training as medical students that continues throughout residency. We also identified several systemic factors that minimize conflict and promote overall working relationships, such as joint conferences, pathways, and methods to promote teaching during consultations.