

Health Professions Education Institute (HPEI)

Title: *Use of Tabletop Simulation and Gamification to Enhance Understanding of Systems-Based Practice in Medical Education*

Presenter: Nathan Bates, MMS PA-C

Co-authors: Brian J Robinson, MS, MPAS, PA-C ; Chris Gillette, PhD

CURRICULAR INNOVATIONS

Problem/Needs Assessment: Systems-based practice (SBP) is defined as “an awareness of and responsiveness to the larger context and system of health care and the ability to call effectively on other resources in the system to provide optimal healthcare”¹. Various health care disciplines rely on the tenants of SBP in order to deliver safe, high value, patient-centered care. However, integrating SBP learnings into medical education has proven difficult and is one of the most abstract core competencies in medical education *and* practice^{2,3}

Program Objectives: Enhance understanding and application of systems-based practice principles for medical learners via gamification-simulation activity.

Description of Program: Using a commercially developed board game, Friday Night at the ER®, 86 pre-clinical year PA students completed an anonymous pre-simulation Systems Thinking Scale (STS) questionnaire⁴, followed by the simulation activity, debrief session, and anonymous post-simulation questionnaire. Pre and post questionnaires were matched using a participant generated anonymity code to ensure one survey was completed for each participant and accurate comparison of the results.

Evaluation/Assessment: Student outcomes were analyzed with descriptive statistics using paired T-test and thematic categorization of qualitative feedback. 86 (100%) pre and post simulation surveys were completed. The majority of participants indicated an initial understanding and agreement with SBP principles prior to the simulation activity. However, analysis of post-simulation questionnaire demonstrated a statistically significant improvement for all quantitative items on the questionnaire except one ($P \leq 0.05$). These gains were further supported by several qualitative themes such as importance of collaboration, innovation, and data driven decision making, along with the impact of mental models and interconnectedness of decision making as it relates to the larger system of care.

Conclusions and Lessons Learned: Ultimately, this tabletop simulation proves a valid tool for students to augment and apply SBP principles while examining the impact on patient care from both a cost and quality standpoint^{1,5,6}. Challenges for curricular implementation include gameboard resources and identification of optimal timing within curriculum. Future plans include repeating this activity with upcoming cohorts while also redesigning it as an interprofessional event with other health professions.

References:

- Chan E, Deziel D, Orkin B, Wool N. Systems-based practice: learning the concepts using a teamwork competition model. *The American Journal of Surgery* 2015; 209:40-44.
- Nabors C, Peterson SJ, Weems R, Forman L, Mumtaz A, Goldberg R, et al. A multidisciplinary approach for teaching systems-based practice to internal medicine residents. *Journal of Graduate Medical Education* 2011;3:75–80.
- Guralnick S, Ludwig S, Englander R. Domain of Competence: Systems-Based Practice. *Academic Pediatrics* 2014;14:S70-S79.
- Moore, S. M., Dolansky, M. A., Singh, M., Palmieri, P., Alemi, F. The Systems Thinking Scale. 2010. Unpublished manuscript.
- Rutledge C, Walsh CM, Swinger N, Auerbach M, Castro D, Dewan M, Khattab M, Rake A, Harwayne-Gidansky I, Raymond TT, Maa T, Chang TP; Quality Cardiopulmonary Resuscitation (QCPR) leaderboard investigators of the International Network for Simulation-based Pediatric Innovation, Research, and Education (INSPIRE). Gamification in Action: Theoretical and Practical Considerations for Medical Educators. *Acad Med*. 2018 Jul;93(7):1014-1020.
- Willig JH, Croker J, McCormick L, Nabavi M, Walker J, Wingo NP, Roche CC, Jones C, Hartmann KE, Redden D. Gamification and education: A pragmatic approach with two examples of implementation. *J Clin Transl Sci*. 2021 Jun 28;5(1):e181.