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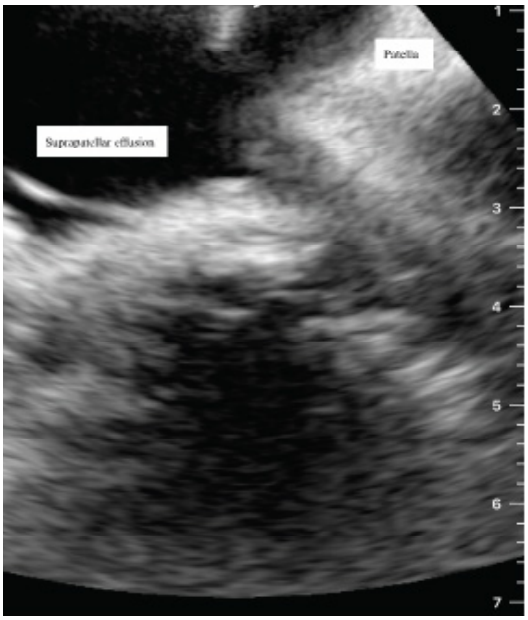
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low-cost, reusable, anatomically accurate simulation phantom for US-guided knee arthrocentesis as well as to determine the educational effect of practicing on this homemade model.

Curricular Design: To create this model, a mold was created of a human knee. A digital model of the knee joint was downloaded from Thingiverse, an open-source three-dimensional (3D)-printing website. A mold for the simulated synovial fluid bladder was designed, printed, and then cast with silicone. The Creality K1 3D printer was used for all prints. Nylon filament was selected for most prints due to its heat-resistant properties that prevent warping when cast in ballistics gelatin. Simpler bladders were trialed but were incompatible with high temperatures or not representative on US imaging. After assembling the knee skeleton and bladder and placing this structure within the knee mold, heated ballistics gelatin was poured in. After cooling, the cast model was removed and ready for use. EM residents then participated in a workshop that included instruction and practice of US-guided knee arthrocentesis.

Impact/Effectiveness: This knee phantom improved upon previous models and allowed for realistic practice of the procedure. The curricular effectiveness of this knee phantom was assessed via analysis of pre- and post-workshop surveys which reported confidence with knee arthrocentesis and improved needle insertion/aspiration. Nonetheless, this knee phantom could be improved upon by making the model less translucent. To counteract lack of experience with 3D-printing/design, we made all of our digital models publicly available. Overall, we believe these phantoms can substantially improve the confidence and competency of learners' skills in US-guided procedures, beyond just knee arthrocentesis.



21 Improving Faculty Performance in Providing Written Feedback to Learners

Kimberly Alford, Allison Schiller, Leigh Patterson

Background: Providing written feedback to ED learners on their clinical performance is key to supporting their development. ACGME and the Liaison Committee on Medical Education require that learners receive feedback in a timely manner to calculate their individual milestones or grades. Despite recognizing the importance of this task, faculty struggle to complete evaluations. Chairs struggle to incentivize teaching productivity.

Objectives: Improve the number of written evaluations completed by faculty working at an academic medical center. Success was defined as medical students receiving an evaluation for 100% of shifts worked and residents receiving an evaluation for 50% of shifts worked during each ED rotation.

Methods: To meet the objective, faculty targets were created and disseminated in the Spring of 2020. Interventions to incentivize faculty performance were added yearly for the next 4 years. First, faculty annual evaluations included the new targets. Next a dashboard was created to track evaluations completed by each faculty. Last, targets were incorporated into the faculty compensation plan. (Table 1) We retrospectively analyzed performance in the two years preceding interventions and the subsequent 4 years.

Results: In 2018-19, faculty completed evaluations on 77% of student shifts and 31% of resident shifts. Performance in both groups improved when targets were included in annual evaluations. Faculty evaluated >50% of resident shifts after the introduction of a dashboard. Faculty evaluated >98% of student shifts and >75% of resident shifts when targets were also included in compensation plan quality incentives. (Figure 1)

Conclusions: Faculty performance in completing learner evaluations improved significantly after creating targets and implementing a series of incentives and visual aids to track progress.

Table 1. Intervention timeline.

Academic Year	Intervention
2019-20	Chair and Education Vice Chair Created Faculty Targets for completing Learner Evaluations and Disseminated
2020-21	Targets incorporated into Annual Evaluation Rubric to Inform Faculty Teaching Scores
2021-22	Power BI Dashboard Created to Allow Faculty to Track their Individual Progress in Completing Resident Evaluations
2022-23	Targets incorporated into Medical School Compensation Plan as Quality Incentive Metrics
2023-24	Medical Student Tracking added to Power BI Dashboard and Timely Deadlines added to Rubrics