Effects of Advanced Cardiac Procedure Simulator Training on Learning and Performance in Cardiovascular Medicine Fellows
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Background
• Simulation-based training has been utilized in various medicine and surgical training environments.
• Prior studies have demonstrated the effectiveness of simulation in endovascular, echocardiographic, endoscopic, and laparoscopic procedures.
• We hypothesized that the integration of a procedural simulation curriculum into a cardiology fellowship program may improve trainee knowledge and performance of three specific cardiac procedures.

Design and Methodology
• Two classes of 1st-year fellows (intervention group) underwent the following simulator training protocol:
  - Viewing of instructional videos detailing each cardiac procedure
  - Simulator training with proctored teaching and feedback
  - Case-based skills assessments at each station following proctor teaching
  - Knowledge assessment via written examination (15 questions)
• One class of 3rd-year fellows did not undergo simulator training (historical controls).
• Using non-parametric testing, we compared written exam results and procedural skills assessments between the intervention group (n=17) and the non-simulator trained controls (n=7).
• The index class of 1st-year fellows (n=9) was reevaluated at 18 months to assess for skills retention.

Performance Results
• Intervention cohort had higher median scores on the written knowledge assessment compared to controls (p=0.038).

Procedure Skills Stations
Figure 3. Procedural Skills Training and Testing Stations for transvenous pacing wire (A), intra-aortic balloon pump (B), and pericardiocentesis (C).

Each teaching/skills testing station was supervised by a trained one-on-one proctor.

Conclusions
• The design, application, and integration of a simulator-enhanced teaching program into a cardiology fellowship curriculum is feasible.
• The teaching protocol employed proved educationally beneficial to our trainees in regards to the acquisition of knowledge and technical skills.
• Without continued training, performances assessment scores decreased over time. Future studies should focus on mechanisms that may facilitate improved skills retention using simulation-based training.

Disclosures
• The authors have no relevant disclosures.