



# Effects of Advanced Cardiac Procedure Simulator Training on Learning and Performance in Cardiovascular Medicine Fellows



Young MN, Markley R, Leo T, Coffin S, Davidson MA, Salloum J, Mendes LA, Damp JB  
Vanderbilt University Medical Center

## 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 1<sup>st</sup>-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 3<sup>rd</sup>-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 1<sup>st</sup>-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).

Figure 1. Skills Results for Simulator vs. Control Groups

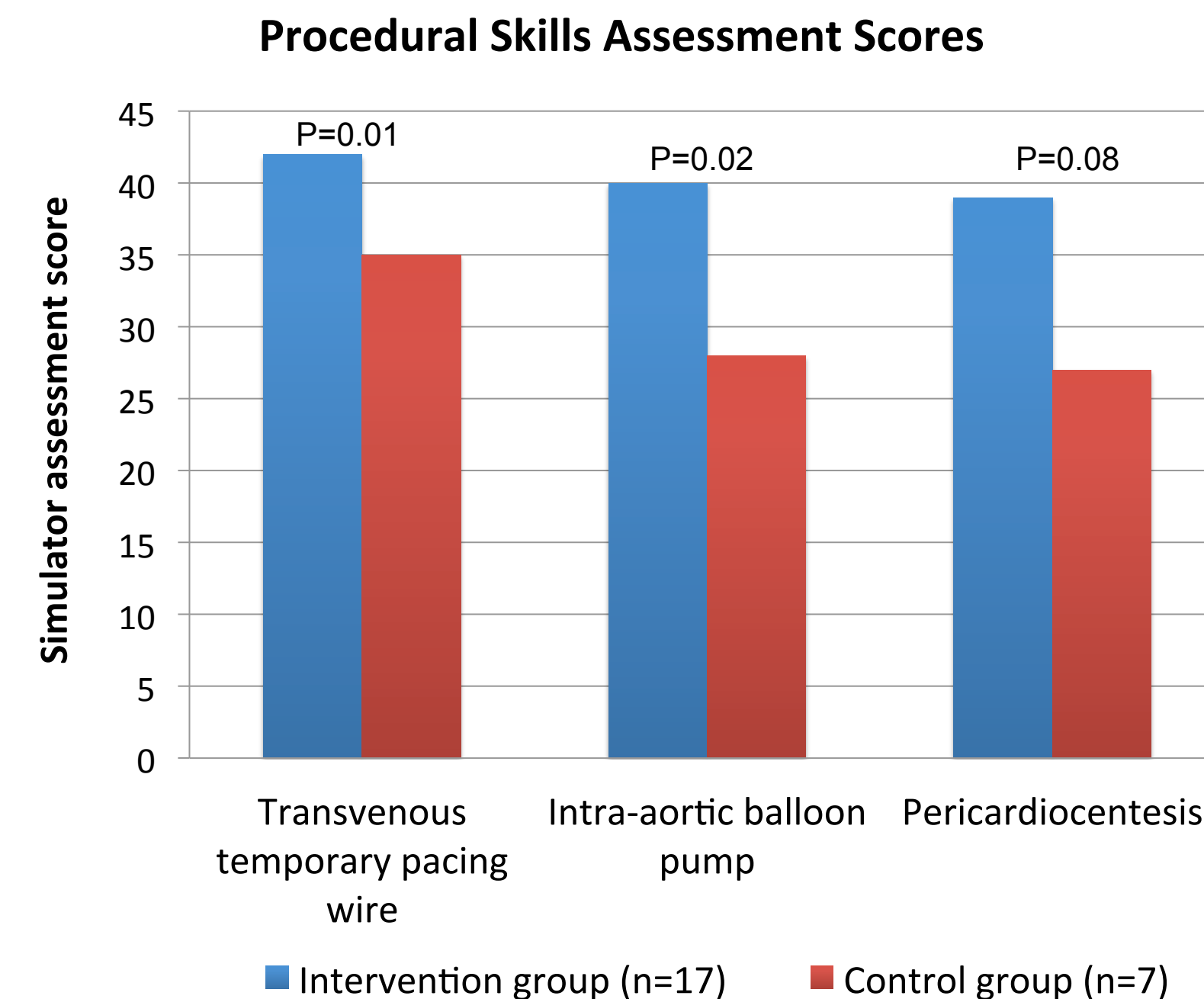
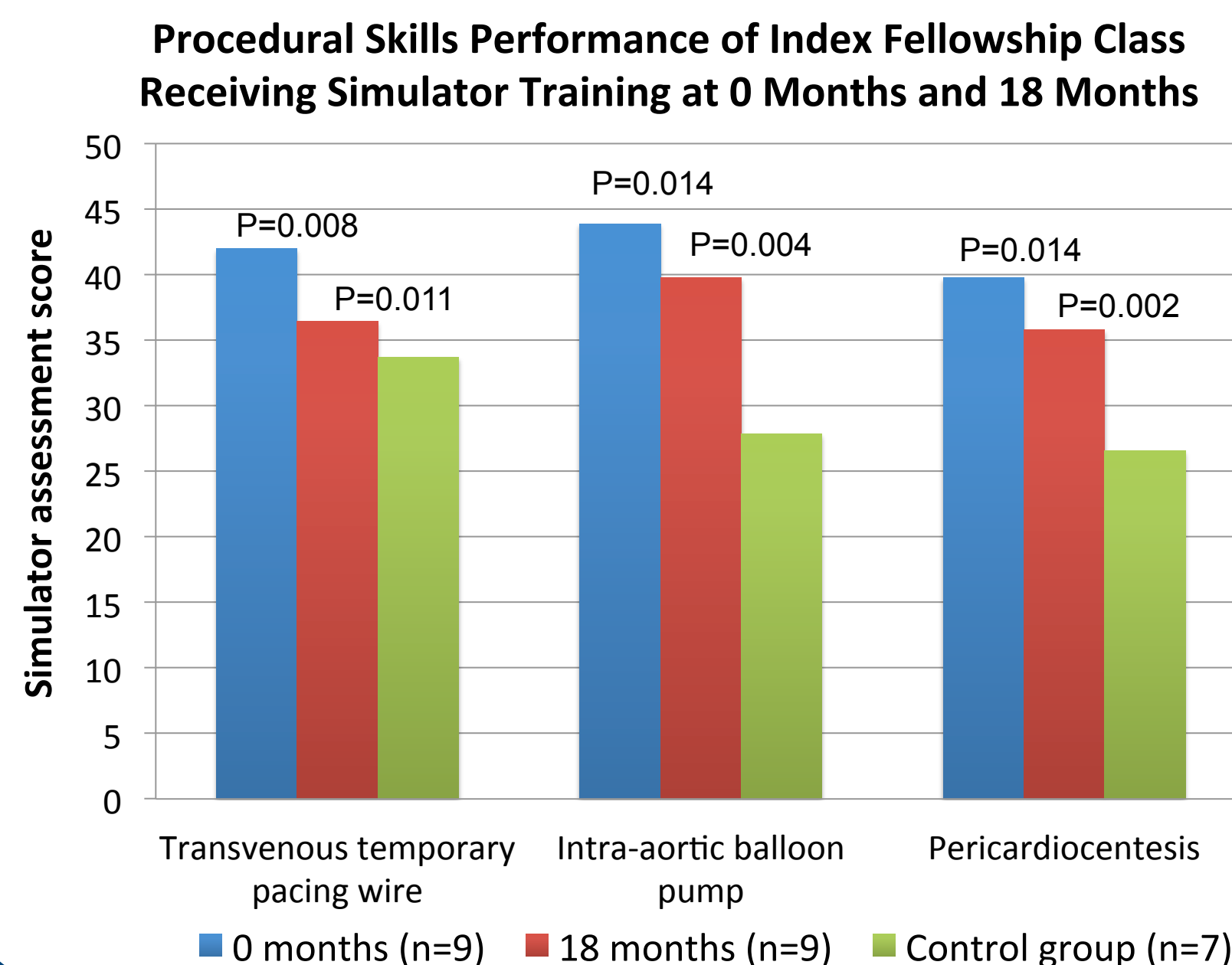
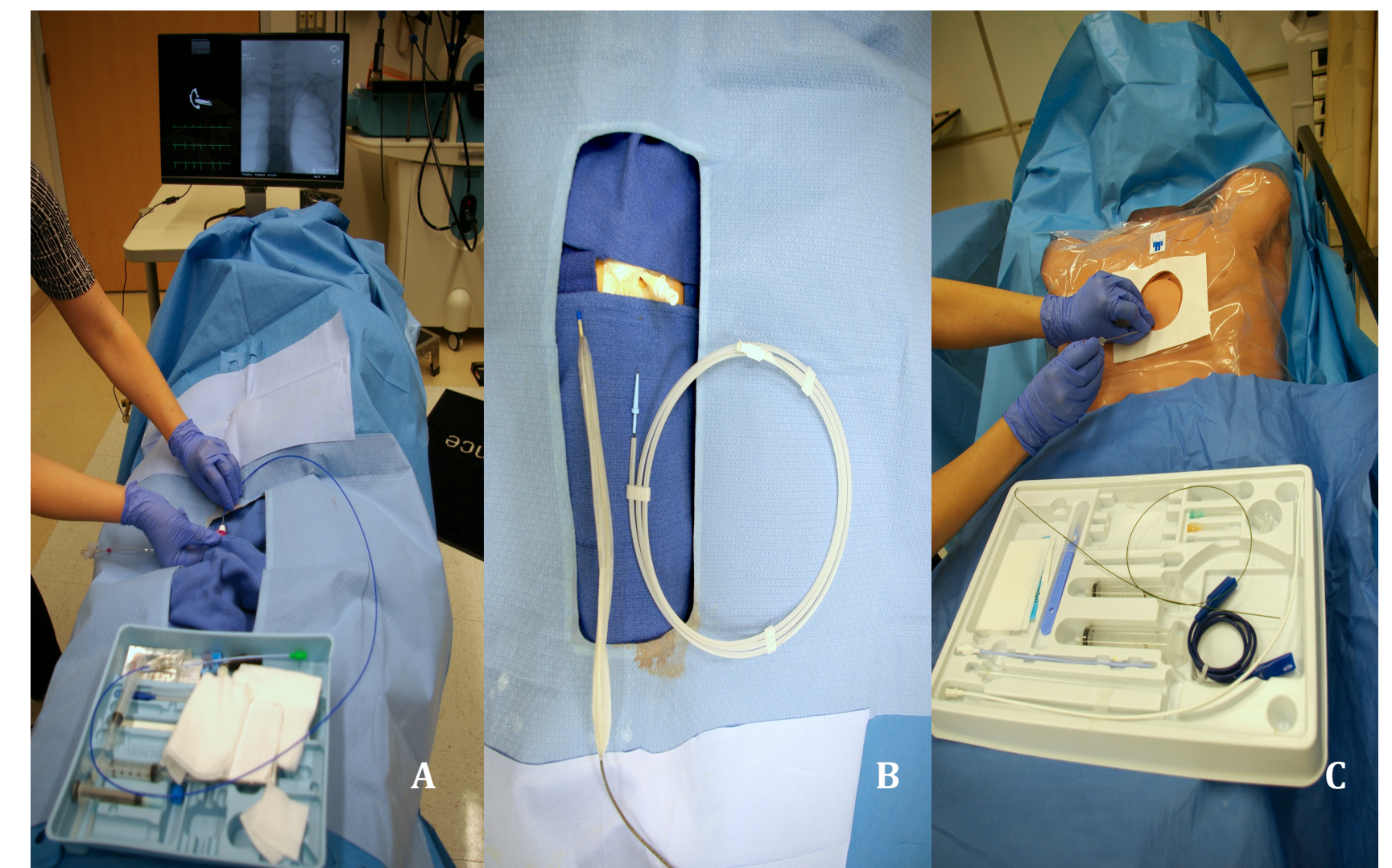


Figure 2. Skills Retention at 18 Months



## 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.