Title: Comparing the Operative Experience of Cardiothoracic Surgery Fellows and Integrated Cardiothoracic Surgery Residents

Author(s) and Affiliations: David A Tecchio, BS; John M Campbell, MD; Eric Sohn, BA

Faculty Mentor(s): Ankit Dhamija, MD; Sivaveera Kandasamy, MD

Background:
Integrated cardiothoracic surgery residency is a rapidly expanding training outlet and has been responsible for about a quarter of newly graduated cardiothoracic surgeons over the last four years. How their operative experience differs from those who trained in traditional pathways is not well understood.

Methods:
A retrospective analysis of ACGME case logs was conducted for cardiothoracic surgery fellows, and integrated cardiothoracic surgery residents for the academic years 2020-2021 through 2024-2025. De-identified case log reports were obtained and divided based on training outlet (fellow vs integrated resident). Surgeries logged both under a surgeon and assistant role were included in the analysis. Fields analyzed included total operative experience (encompassing both large and small procedures), major operative experience (large procedures), all anatomic and procedural subdivisions of major operative experience, and non-surgical management. Welch's t test was performed to investigate significant differences among the cohorts studied.

Results:
Integrated residents logged more total operations than fellows (1,102.9 ± 45.3 vs. 880.0 ± 35.8; 20.2%; $p < 0.001$). Major operative volume was also higher (947.6 ± 78.2 vs. 723.4 ± 31.4; 23.7%; $p < 0.001$), while minor operative volume was similar (155.3 ± 4.8 vs. 156.6 ± 38.3; $p = 0.909$). Total adult cardiac experience was greater among integrated residents (659.3 ± 95.0 vs. 446.6 ± 41.0; 32.3%; $p = 0.001$). Fellows had lower volumes across all cardiac subdivisions including acquired valvular disease (37.0%; $p = 0.002$), interventional procedures (38.9%; $p < 0.001$), aortic surgery (41.6%; $p = 0.002$), myocardial revascularization (22.9%; $p = 0.001$), and circulatory assist/transplant (29.2%; $p = 0.021$). Congenital heart surgery exposure was also lower (28.7%; $p = 0.001$). Total adult thoracic operative volume did not differ between pathways (240.6 ± 13.3 vs. 242.8 ± 60.1; $p = 0.829$), with similar volumes for lung resection, pleural procedures, and esophageal surgery (all $p > 0.05$). Bronchoscopy volumes were comparable ($p = 0.811$), while fellows performed fewer upper GI endoscopies (23.9%; $p = 0.031$) but more mediastinal assessments (29.2%; $p = 0.008$). Integrated residents logged more consultations (37.5%; $p = 0.011$), while critical care case management was similar ($p = 0.128$).

Conclusions:
Overall, integrated residents log 20% more total procedures and 24% more major operations than cardiothoracic surgery fellows. These enhancements in operative exposure are driven entirely by cardiac surgery volume. Exposure to general thoracic surgery is not significantly different between integrated residents and fellows.