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## EMR-Driven Delivery of EPA Assessments Significantly Improves Participation

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Entrustable professional activities, competency, surgical education

### Abstract

#### Background:

Digital education tools are a cornerstone in the evolution to a data-centered competency-based education system through EPAs. A successful migration requires a solid understanding of the variable impacts of EMR-driven delivery of EPAs, of flexible digital device access to EPAs, and of user-behavior trends for assessment completion.

#### Methods:

Through a HIPAA compliant, EMR-integrable surgical education platform (Firefly Lab), general surgery training programs at 16 institutions from July 2023 to October 2023 collected EPA micro assessments. At 5 EMR-integrated institutions (EMR+), EPAs were created for appropriate clinical activities based on the OR schedule and automatically pushed to attendings and residents. At 11 institutions without EMR integration (EMR-), attendings and residents could initiate EPAs manually. We compared the EMR+ and EMR- groups, computing descriptive statistics on the EPAs completed and user behavior metrics. EPAs could be completed on either a web-interface or mobile-interface. The platform optimized both the automated EMR-driven workflow and the manual "Instant EPA" workflow.

#### Results:

We collected 1393 EPAs in total, with 1102 (79.1%) EMR+ institutions and 291 (20.9%) at EMR- institutions. 1289 (92.5%) of completed EPAs were automatically triggered by the OR schedule,

and 104 (7.5%) were manually initiated. Attendings at EMR+ institutions very strongly preferred the automated OR-triggered workflow to start their EPAs (Chi-squared test,  $p \approx 0$ ). Attendings completed EPAs for 35.1% of available cases in their OR schedules.

Attendings nearly always completed the full evaluation across care phases (pre-op, intra-op, and post-op), with all 3 phases in 83.7% of EPAs in EMR+ institutions and 85.3% in EMR-, 2 phases in 7.7% in EMR+ and 4.3% in EMR-, and with only 1 phase in 8.6% in EMR+ and 10.4% in EMR-. The most commonly completed phase was intraoperative (98.1% in EMR+ and 91.8% in EMR-). Almost all EPAs were initiated by the attending, especially with EMR integration (attendings with 83.7% of EPAs in EMR+ and 73.5% in EMR-, vs. residents with 16.3% in EMR+ and 26.5% EMR-by residents). Residents opened their feedback promptly, within approximately an hour after the attending completed the EPA (median of 68 minutes in EMR+ and 50 minutes in EMR-). Most EPAs were completed on a computer vs. a phone (62.7% for attendings on computer and 89.0% on computer for residents). EPAs were most commonly submitted within 30 minutes of the automated assessment requests.

#### Conclusions:

EMR-driven delivery of EPA assessments leads to a 4-fold increase in EPAs completed. EMR data integration allows the tracking of all EPA-relevant clinical events, the fraction which result in EPAs, and the measurement of selection bias. EPA initiation is the most critical phase in the EPA workflow. Residents view their results promptly, demonstrating the value of recorded EPA feedback, complementing the verbal feedback at the conclusion of an operation. Completion by computer is strongly favored over by mobile devices.