A Socially Distanced Approach to Surgical Education: A Hybrid Web and Simulator-Based Course for Laparoscopic Common Bile Duct Exploration

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Background

- The COVID-19 pandemic has had a profound impact on surgical education.
- Social distancing and travel limitations have made many large-scale in-person courses untenable.
- We adapted a laparoscopic common bile duct exploration (LCBDE) course into a "**hub-and-spoke**" model in which a central site led satellite centers using a hybrid web and hands-on simulator-based mastery learning curriculum.

Methods/Study Design

- Faculty underwent a pre-course **"train-the-trainers"** curriculum focused on principles of simulator-based education and use of the rating scale.
- Day-long courses were then led by faculty based in Chicago with content streamed via **a web-based platform to satellite centers** with local faculty and learners.
- Pre- and post-tests were assessed using a previously validated LCBDE procedural rating scale with a **mastery standard** that had been developed using a **modified Angoff method**.

Mastery Learning Model

- Learners completed a simulator-based **pre-test** at the onset of the course.
- Course curriculum consisted of streamed lectures followed by **hands-on deliberate practice** using an LCBDE-specific simulator.
- Learners then completed an identical **post-test** on the simulator.

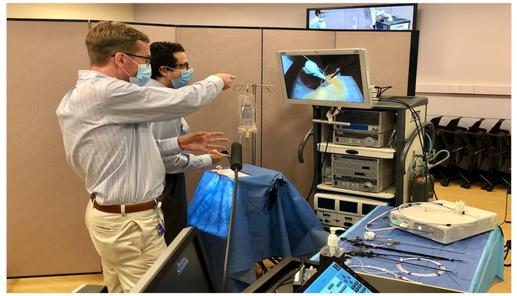


Fig 1. Live demonstration of the simulator and key steps being streamed via a web-based platform to all satellite centers during the live curriculum

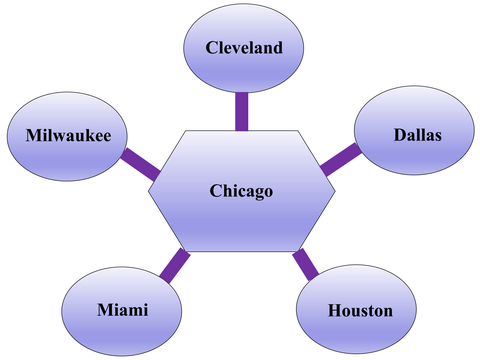


Fig 2. Schematic representing the hub and spoke model of the web-based curriculum.

Results

- 40 attending and fellow-level surgeon learners participated
- 2 courses held in Chicago and at 9 satellite locations.
- Mean of 9 years of post-training experience with 48% having ≤5 years in practice.
- Only 62% had any prior experience preforming LCBDE
- **Pre-Testing:** 88% of learners failed to meet the mastery standard (a score of ≥ 31 out of 45).
- **Post-Testing:** 100% met or exceeded the mastery standard
- Mean scores were significantly improved (pre-test 24 ±8 vs post-test 43 ±2; scale 0-45, p<0.001).
- When analyzed separately, even the five participants who passed the pre-test had a significant increase in their post-test scores (36 ±3 vs 43 ±2, p<0.01).

Conclusions

- Used a multisite course design to overcome COVID-19 travel restrictions
- Trained surgeons uniformly to a mastery standard in LCBDE.
- This hybrid web and hands-on simulator-based approach can serve as a model for other procedural curricula during the COVID-19 era and beyond.

References:

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