

Streaming Live Procedures for a Virtual Medical Student Rotation in the Era of COVID-19

Christopher Doe, MD, Luke Byers, DO, Kristofer Schramm, MD, Premal Trivedi, MD, Gordon McLennan, MD, Matthew Brown, MD, Paul Rochon, MD, Kimi Kondo, DO, Jonathan Lindquist, MD

Introduction:

Due to the COVID-19 pandemic, in-person rotations were banned during the 2020-2021 academic year for visiting medical students. Interventional radiology at many institutions including the University of Colorado utilizes electives to teach and recruit potential future residents. To adapt to the pandemic, an immersive virtual elective was designed and implemented during the 2020-2021 academic year with a reasonably low start-up cost.

Materials and Methods:

Approval for the cloud-based rotation was obtained from the hospital HIPAA committee, data security office, and medical school. Equipment included purchase of a: laptop computer, a wide-angle high definition camera (GoPro, San Mateo, CA), and DVI Video Capture Cards (StarTech, Groveport, OH). Two-way communication was handled via Bluetooth headphones (AirPods, Apple Inc, Cupertino, CA). Video sources including direct fluoroscopy feed and patient vitals were captured using video capture cards, and were streamed to an RTMP server (MonaServer). Source streams were received and organized using Open Broadcast Software. Protected health information was cropped from images prior to broadcast. Stream was then output to Microsoft Teams for secure virtual meeting with medical students on rotation. Each patient was consented for participation in the virtual rotation in the clinic or pre-procedure area prior to streaming. Startup cost was budgeted at \$5432.

The 2 week elective consisted of a combination of live streaming during morning rounds, live streaming of cases with two way communication, live and pre-recorded lectures as well as medical student presentations at the end of the elective.

Surveys were developed and distributed to medical students before and after the elective to evaluate interest in IR and the perceived quality of the elective rotation

Results:

7 responses were recorded to the elective. Of the respondents, 6/7 had previously rotated with a separate IR rotation in person, and none had participated in a virtual rotation. 6/7 respondents recorded a "very high" (Likert scale 5) as their interest in IR while 1/7 had no interest (Likert scale 1). Regarding their learning expectations, 100% of respondents met or exceeded expectations.

Conclusion:

Virtual electives are feasible in the COVID-19 era with low startup costs and with good participant satisfaction. Live streaming of cases remains technically feasible and secure utilizing existing hospital infrastructure.