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Adult Hip and Knee Reconstruction Education during the COVID-19 Pandemic



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ABSTRACT

Background: The COVID-19 pandemic caused an abrupt disruption in residency and fellowship training, with most in-person teaching ceasing in March 2020. The AAHKS (American Association of Hip and Knee Surgeons) Board of Directors quickly initiated an online lecture series named the Fellows Online COVID-19 AAHKS Learning initiative. The purpose of this study is to illustrate the impact that this educational platform had on residents and adult hip and knee reconstruction fellows.

Methods: Between March 31, 2020 and June 25, 2020 an online educational platform was simultaneously developed and delivered. Adult hip and knee reconstruction fellows and residents were invited to participate in the free, live, online education sessions. Faculty from well-respected institutions from around the United States volunteered their time to host the initiative, choosing topics to present, ranging from hip (13 lectures) and knee (9 lectures), to practice management/miscellaneous (12 lectures). Attendee registrations were tracked via the online platform and the maximum number of attendees per session was recorded. A survey was administered to attendees for feedback.

Results: Thirty-four, 1-hour virtual lectures were delivered in real time by 79 different faculty members from 20 different institutions. A total of 4746 registrations for the 34 lectures were received, with 2768 registrants (58.3%) attending. The average attendance was 81 viewers per session (range 21–143), with attendance peaking mid-April 2020. A survey administered to lecture participants showed that 104/109 (95.4%) attended live lectures and 93/109 (85.3%) watched recorded sessions. About 92.5% of attendees responded that they wanted the lectures to continue after clinical responsibilities resumed.

Conclusion: Amid a pandemic with cessation of in-person training, AAHKS delivered a robust virtual training alternative, exposing residents and fellows to a variety of renowned faculty and topics. Attendance with the program was very high, along with continued interest to continue this initiative. These worldwide lectures may lead to future opportunities in virtual residency and fellowship education.

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The COVID-19 pandemic was first recognized in the United States in early 2020, and by March 2020 resulted in sudden disruption of elective surgery and in-person surgical training. Given

the hands-on nature of orthopedic surgery training, this disruption caused a substantial impact on orthopedic surgery fellows who only have 1 year of specialized training prior to starting their careers. In multiple subspecialties, there have been concerns that the decrease in the volume of cases caused by the pandemic would prevent trainees from meeting Accreditation Council for Graduate Medical Education case minimums [1–6]. Several orthopedic surgery fellowships, including adult reconstruction [7], spine [8], and sports medicine [9], have noted significant decreases in case volumes.

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To combat the sudden loss of in-person learning and training, multiple institutions converted to online learning modules. In one spine fellowship, they initiated daily didactics creating a comprehensive educational curriculum utilizing their own staff members to educate residents and fellows [10]. Other subspecialties, including sports medicine [9], cardiology [11], radiology [12], pain management [13,14], and sleep medicine [15], switched to web-based journal clubs and didactics. In the subspecialty of gastroenterology, the American Gastroenterological Association started a learning platform called “GI Distance Learning” [16]. Similarly, the American Association of Hip and Knee Surgeons (AAHKS) Board of Directors met on March 25, 2020 and created an online educational platform for adult hip and knee reconstruction fellows and residents named the Fellows Online COVID-19 AAHKS Learning (FOCAL) initiative [17]. The purpose of this educational forum was to provide a learning opportunity for residents and fellows to fill the void that the pandemic and social distancing caused. AAHKS provided the infrastructure and organization, while the board organized the faculty, allowing residents and fellows in adult reconstruction to receive teaching from prominent institutions and thought leaders across the nation.

Few articles have been published on the educational impact of COVID-19 on resident and fellow education [18], especially in adult hip and knee reconstruction. Thus, the purpose of this study is to summarize the FOCAL initiative, quantify participation, and present the results of a questionnaire administered to participating residents and adult reconstruction fellows.

Materials and Methods

The idea to initiate a virtual lecture series was discussed among a small group of orthopedic surgery educators, and formally

pitched to the board of AAHKS on March 25, 2020. Following AAHKS Board of Directors approval in March 2020, the first FOCAL lecture was given on March 31, 2020. Each of the sessions was scheduled for 1 hour, using start times to attract as many trainees as possible in different time zones, with usual starting times in the mid-afternoon or evening Eastern Standard Time. Adult hip and knee reconstruction fellows and residents with an interest in adult reconstruction were invited to participate in the free, live, online education sessions. Initially, because AAHKS helps coordinate the adult reconstruction fellowship match, all programs that participate in the match were contacted to invite their fellows and residents to sign up for the FOCAL sessions. The fellowship match email list was also used to send invitations. Over time, those who expressed interest were added to the distribution list as news of the events was spread via marketing from the AAHKS website, newsletter, and word of mouth.

The lectures utilized the Zoom online meeting platform. This allowed faculty and attendees to interact during the lecture in several ways. Because the sessions were designed to be as interactive as possible, faculty would involve attendees by asking direct questions and allowing them to unmute to discuss cases or ask questions. Attendees could also use the chat box feature to ask questions, and 1 faculty was usually assigned to respond to these questions and incorporate them into the discussion. Each lecture session was hosted by 2–4 volunteer faculties from training institutions from around the United States, using PowerPoint to present the didactic lectures and case presentations. Between March 31, 2020 and June 25, 2020, there were a total of 34 one-hour virtual lectures delivered in real time by 79 different faculty members from 20 different institutions (Fig. 1). The topics included the hip (13 lectures), the knee (9 lectures), and practice management/miscellaneous (12 lectures).

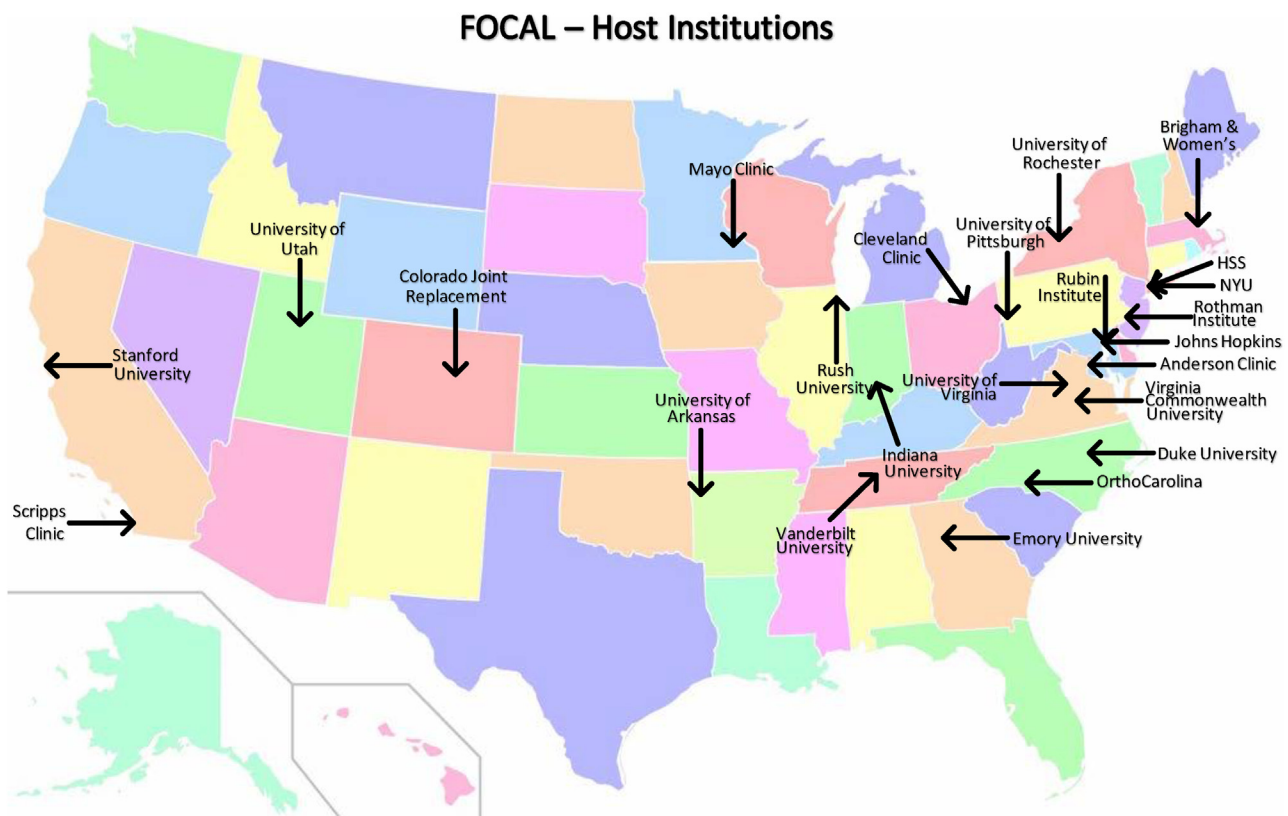


Fig. 1. Map showing participating institutions from around the United States between March 31, 2020 and June 25, 2020.

Although there were no paper handouts provided, all sessions were recorded and posted on the AAHKS website for viewing. Attendee registrations were tracked via the online platform and the maximum number of attendees per session was recorded. On May 1, 2020, a prospective survey was administered to attendees for feedback. The survey questionnaire included questions on how many live sessions each individual attended, how many recorded lectures each individual viewed, and the quality of the initiative based on presentation quality, session topics, topic variety, topic relevance, and faculty. Further questions were asked based on future topics of interest, best timing for lectures, whether the initiative should be continued, and how often sessions should be held.

Survey results were listed as descriptive statistics, with ranges when available.

Results

A total of 4746 registrations for the 34 lectures were received, with 2768 registrants (58.3%) attending. The mean attendance was 81 viewers per session (range 21–143), with attendance peaking mid-April 2020, and a gradual decline was observed as the ban on elective surgery was lifted in May 2020 (Fig. 2). The most attended session was on “Current Approaches to the Prevention, Diagnosis and Treatment of Periprosthetic Joint Infection.”

Of the 405 individuals who were surveyed, 109 individuals responded to the survey for a 26.9% response rate. Of those who responded to the survey, 52.3% were in fellowship, 38.3% were in residency, 9.4% were in practice. Although 5/109 (4.6%) did not

attend live sessions, 14.7% attended 1–3 live sessions, 21.1% attended 4–6 live sessions, 15.6% attended 7–9 live sessions, 11.0% attended 10–12 live sessions, and 33.0% attended 13 or more live sessions (Fig. 3). With regards to recorded sessions, 14.7% watched no recorded sessions, 32.1% watched 1–3 recorded sessions, 23.9% watched 4–6 recorded sessions, 12.8% watched 7–9 recorded sessions, 7.3% watched 10–12 recorded sessions, and 9.2% watched 13 or more recorded sessions (Fig. 4).

The topics of greatest interest to attendees who responded to the survey were case discussions (86.0%), clinical topics (66.4%), starting practice (61.7%), practice management (57.0%), coding and billing (50.5%), and advocacy (12.2%). Survey respondents rated all lecture parameters to be excellent or good; 90.7% of presentations were excellent quality, 90.6% of session topics were excellent quality, 89.6% had excellent variety of topics, 93.4% had excellent relevance of topics, and 96.2% stated that the faculty was excellent. About 92.5% of attendees surveyed responded that they wanted the lectures to continue after clinical responsibilities resumed, while the remainder only wanted to continue lectures until the end of the pandemic.

Discussion

During COVID-19, the sudden cessation of elective cases substantially reduced trainee exposure to live surgery, and increased the amount of time available for didactic learning. Due to social distancing mandates, lectures and teaching initiatives across the nation were largely converted to a virtual format. Although many institutions commenced their own educational initiatives, few

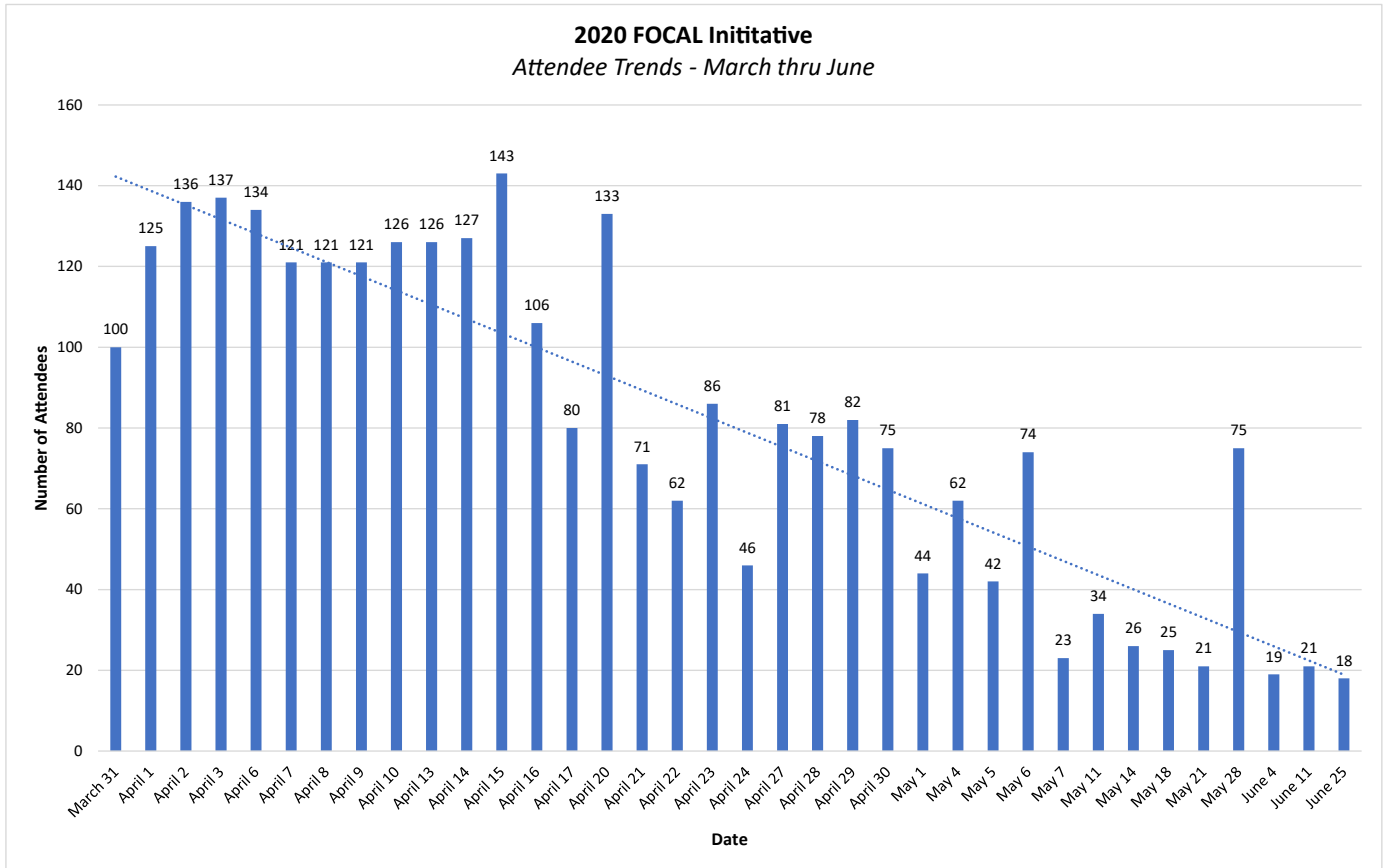


Fig. 2. Graph illustrating the number of participants per teaching session over time. A gradual decline can be seen in number of live participants.

How many live FOCAL Initiative sessions have you attended?

Answered: 109 Skipped: 0

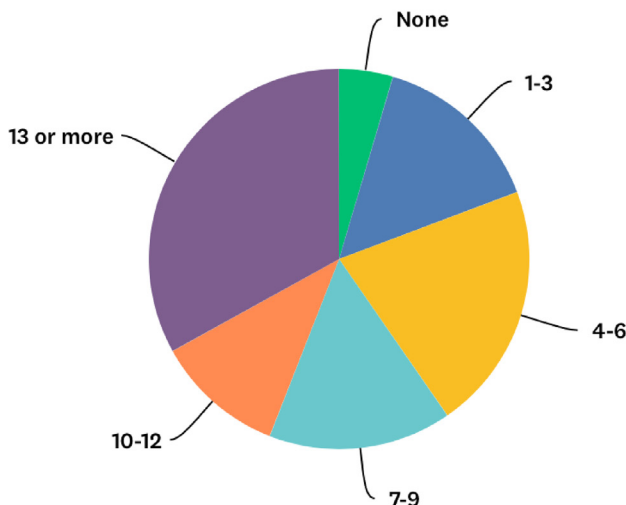


Fig. 3. Percentage of live lecture sessions attended by those surveyed.

national societies took the advantage to launch nationwide lectures that included faculty from different institutions. The AAHKS FOCAL initiative commenced in March 2020 and included 34 lectures in an open platform, allowing access to residents, fellows, and attendings in adult reconstruction both in the live setting and on the AAHKS website as recorded videos. A subsequent survey determined that most individuals watched the sessions live, and that attendees found the case discussions to be of greatest benefit. Over time the attendance to the virtual lectures in real time gradually diminished, reflecting both the concomitant return to in-person work, along with the residents and fellows discovering that they could watch the lectures recorded at a later time. Ratings of quality metrics

including presentation and topic quality were excellent. Over 90% of survey respondents wanted the initiative to continue once clinical responsibilities resumed.

Multiple survey studies were conducted evaluating resident and fellowship education during COVID-19. In general surgery, surveys of residents showed that they received more didactic teaching during the pandemic than prior to the pandemic, as the majority (80.6%) went to completely online platforms [19]. In a survey of hematology and oncology fellows at a single institution, 100% of individuals appreciated the flexibility of online didactics, but only 63% felt that they learned the same amount online as in-person [20]. In otolaryngology, there was a combination of institutional-based

How many recorded FOCAL sessions have you watched?

Answered: 109 Skipped: 0

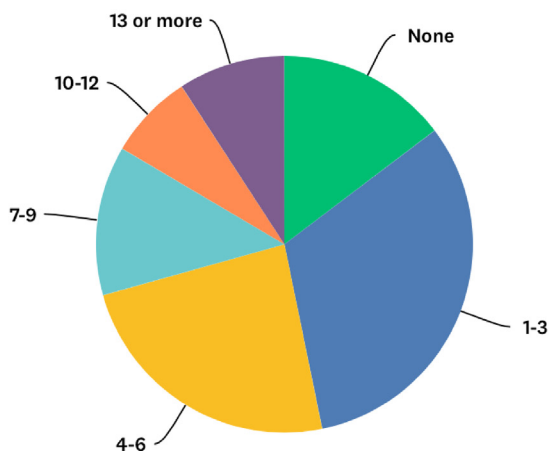


Fig. 4. Percentage of recorded lectures attended by those surveyed.

didactics (62.3%) and multi-institutional collaborative efforts (61.7%), although there were no national society efforts [21]. Finally, in orthopedic surgery, trainees favored electronic learning compared to in-person lectures by attendings (51.4% vs 32.2%). Furthermore, respondents revealed that participating in didactics during the pandemic allowed trainees to attend conferences in their subspecialty of interest while rotating on a different service [22]. Interestingly, both resident and attendings in this study agreed that they were more likely to pay closer attention during in-person learning compared with remote learning, a point that needs to be remembered as education is designed for the post-pandemic era.

This study demonstrated good utilization of a national platform for online learning in the field of adult reconstruction. What differentiated our initiative from others was that it was sponsored by a national society (AAHKS) and involved faculty and participants from multiple institutions. One of the many benefits of this program was this new opportunity for attendees to be exposed to different perspectives and techniques of surgeons across the country. It also allowed the opportunity for participants to engage in case discussions and learn from individuals outside of their institution, demonstrating different thought processes, surgical techniques, and practice management principles. At most of the institutions that host adult reconstruction fellowships, there are a small number of faculties. Although most faculties are considered experts and thought leaders in the field, no one faculty can be an expert or have published on all topics. The FOCAL initiative provided attendees exposure to some of these experts from other institutions who have unique perspectives and have published on these topics. Exposure to a wide variety of thought leaders was one of the highlights of this program. Similar to other fields, such as gastroenterology and the use of video capsule endoscopy [23], the goal of the AAHKS FOCAL program is to continue didactic teaching throughout the academic year, as requested by survey respondents.

Although this study was the first to report on the AAHKS FOCAL initiative, the main limitation to this study was the low response rate among those who attended the FOCAL sessions. Additionally, there is no comparative group of responses, as this is the first year this initiative is offered. Although we tracked the total number of attendees to each session, we did not keep a roster of those attendees, so we cannot specify how many of the attendees were residents, fellows, or attendings, and therefore cannot determine what percentage of trainees participated. Also, we did not study any metric to measure knowledge gain by attendees, so we cannot conclude that this initiative helped residents or fellows with in-training examinations or board preparation. We also did not collect information on what educational efforts were concomitantly occurring at home institutions, and whether this reduced the burden on those faculties. The authors can only state anecdotally that knowing that these daily lectures were occurring did provide some comfort that trainees had access to what subjectively appeared to be high value, interactive sessions with well-respected faculty. Finally, future studies are needed to better understand the impact of these FOCAL lectures on other outcomes, such as reducing the need for Orthopedic In-Training Exam or American Board of Orthopedic Surgery preparation, improvement in scores, and reducing the burden of teaching arthroplasty-related topics on local faculty.

Despite these limitations, this study demonstrates that this COVID-19 lecture initiative for adult reconstruction residents, fellows, and attendings was successful at providing didactics to individuals during the pandemic. Both live and recorded attendance

was very high, and participants experienced excellent quality and variety of lectures. This initiative may lead to future opportunities in virtual fellowship education.

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