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Use of the Internet to Facilitate an Annual Scientific Meeting: A Report of the First Virtual Chest Wall Injury Society Summit

Babak Sarani, MD, FACS,* Adam Shiroff, MD, FACS,† Fredric M. Pieracci, MD, FACS,‡ Mario Gasparri, MD, FACS,§ Thomas White, MD, FACS,¶ SarahAnn Whitbeck, MBA, CHCP,# and Ronald Gross, MD, FACS**

*Center for Trauma and Critical Care, Department of Surgery, George Washington University, Washington, DC; †Department of Surgery, University of Pennsylvania, Philadelphia, Pennsylvania; ‡Department of Surgery, Denver Health Medical Center/University of Colorado School of Medicine, Denver, Colorado; §Department of Surgery, Medical College of Wisconsin, Milwaukee, Wisconsin; ¶Department of Surgery, Intermountain Medical Center, Salt Lake City, Utah; #Chest Wall Injury Society, Salt Lake City, Utah; and **Department of Surgery, St. Francis, Hartford, Connecticut

INTRODUCTION: The COVID-19 pandemic has resulted in cancellation of medical peer meetings. The Chest Wall Injury Society Annual Summit was scheduled for April 2020. Due to safety concerns, the Society altered the meeting to an online format. The purpose of this paper is to describe how this was accomplished and also to highlight its outcomes.

METHODS: An online survey of participants was carried out to assess their views on the educational yield and technical difficulties encountered as compared to in-person meetings.

RESULTS: Sixty two of 275 (23%) registered participants filled out the survey. Eighty four percent felt that the educational quality was excellent/good. Seventy five percent and 95% felt in-person meetings are better for education and for networking, respectively. Eighty seven percent preferred in-person meetings in the future but would attend a virtual meeting again. Thirteen percent had technical difficulties accessing the meeting.

CONCLUSION: Online meetings are feasible but in-person meetings have more educational and networking value. (J Surg Ed 000:1–7. © 2020 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: Virtual, Online

COMPETENCIES: Practice-Based Learning and Improvement, Interpersonal and Communication Skills, Systems-Based Learning

INTRODUCTION

All large peer medical societies have an annual meeting which serves both professional and social goals. Professionally, such meetings allow for exchange of ideas, presentation of novel research, and collaboration across institutions and countries. Socially, such meetings allow younger investigators to meet their peers as well as more senior colleagues and to practice their skills in presenting their work. These attributes may, in turn, foster one’s career by enhancing contacts and skills needed to obtain research grants and new job opportunities. These endpoints are so vital to the development of a young surgeon’s career that they are codified in the Eastern Association for the Surgery of Trauma tag line, “Advancing Science, Fostering Relationships, and Building Careers.”

Use of the internet for real-time “virtual” meetings is well established, and there are a multitude of companies and platforms available to facilitate this task. Lessons learned from previous experiences both in the corporate sphere and within medical education indicate that “virtual” meetings may have advantages such as being easier to access and potentially decreasing cost barriers.
to participation. A previous survey study of 27 participants who attended the COPERNICUS Alliance Online Conference in 2019 found that the majority liked this format and favored a strategy of alternating in-person with online meetings each year.3 However, overall experience with an online design for medical education conference is very limited.

The Chest Wall Injury Society (CWIS) is an international peer society with 255 members across 22 countries. The mission of CWIS is to optimize the operative and nonoperative care of patients with chest wall injury. In 2020, the Annual CWIS Summit was scheduled to be held from April 23 to 25 in Denver, Colorado.

The COVID-19 pandemic has resulted in a global moratorium on all non-essential travel. This pandemic became prevalent throughout the United States mostly in March 2020. At nearly all universities and medical centers, the travel moratorium was extended to include travel to scientific conferences, either as a faculty member or as an audience participant. The result of this has been cancellation of nearly all, if not all, regional and national medical peer meetings starting as early as February 2020 and extending into February 2021.3,5,6

Due to the moratorium on travel, the leadership of CWIS made the decision to move the meeting from a traditional in-person format to an online format. Because the CWIS Annual Summit was scheduled to be held in April, this provided only 6 weeks to restructure the meeting. The purpose of this paper is to both describe how this was accomplished in a relatively short timeline and also to highlight the outcomes related to the first “virtual” Summit. We hope that other societies can use our early experience and results in modeling their online meetings.

RESULTS

There were 275 healthcare registrants, of whom 113 were physicians in training and were offered complimentary registration. Only 3 participants requested a refund of their registration fee. The majority of registered participants were from the United States (n = 200, 73%). The remainder were mostly from Australia/New Zealand (n = 15), Malaysia (n = 10), Central/South America (n = 9), Europe (n = 8), and China (n = 4). Twenty nine participants did not state where they lived. An additional 760 industry representatives were offered complimentary registration because their company had agreed to serve as a sponsor of the in-person meeting before the decision was made to convert to a virtual platform.

Two hundred seventy five registrants were invited to fill out a survey regarding the experience and 62 (23%) did so. Forty eight (77%) of the respondents were from the United States. The remainder of the respondents was from Japan (1), China (1), Australia (6), Brazil (1), and Europe (United Kingdom 2, Sweden 1, and Netherlands 1). Forty four respondents (71%) were attending physicians, 11 (18%) were physicians in training (residents), and 3 (5%) were advanced practitioners. Forty eight (77%) of respondents were between the ages of 25 and 54 years old and 6 (10%) were over age 65.

Respondents stated that they watched an average of 66% of the conference and that they would watch an average of 55% of recorded content within the next year. As well, 19 (32%) registered participants, who completed the survey, stated that they had 1–3 others watching the virtual summit with them. Twenty six (42%) of the respondents stated that this was their first CWIS meeting while 14 (23%) had attended all CWIS meetings since the inception of the Society in 2015.

METHODS

Participants were grouped based on healthcare provider and industry representative status. Physicians who had completed their training paid for the meeting whereas physicians in training were offered complimentary registration. Paid attendees were offered a refund when the meeting format was changed to online. Once the Summit was changed to a virtual setting, sponsoring corporations were provided broad latitude in terms of the number of their representatives who could attend the meeting as a benefit of their corporation’s sponsorship of the event.

CWIS members were encouraged to notify residency program directors and other leaders within Departments of Surgery that the virtual summit was being provided free of charge to physicians in training. This was also advertised via various CWIS social media accounts.

After obtaining Institutional Review Board approval, a survey of those who participated in the virtual meeting was carried out approximately 1 month following the meeting. All healthcare personnel were emailed a Survey Monkey link and invited to partake in the study. The survey assessed both the participant’s view of the online experience as well as their views regarding the medical content of the meeting—the latter being standard for continuous medical education events. Two follow-up email reminders as well as several announcements via CWIS social media channels were sent for completion of the survey. Demographic information regarding their age, discipline, and location where they practice was collected. Next, participants were asked to compare the quality of education imparted, interruptions to attending the meeting, and technical difficulties with accessing the meeting to their past experiences with in-person CWIS meetings. Descriptive statistics were used to analyze results.
Fifty two (84%) of the respondents rated the overall educational experience of the virtual summit as excellent or very good. One individual rated it as fair and no respondent rated it as poor. When asked about specific education goals of the meeting using a Likert scale of 1-5 where 1 meant “strongly disagree” and 5 meant “strongly agree,” the weighted average for any question ranged from 3.98 to 4.30 (Table 2). The lowest score (3.98) was in reference to learning how to contribute to a database regarding chest wall injury. The highest score (4.30) was in reference to understanding current research in this field and being to analyze patient cases discussed at the meeting.

With regard to perceived differences between a virtual and an in-person meeting, the majority of respondents felt that an in-person meeting is more conducive to full engagement in educational activities (75% vs 15%), interaction with presenters (55% vs 23%), interaction with vendors (92% vs 2%), and networking with peers (95% vs 3%) (Table 1). In terms of future meetings, 87% of respondents stated that they would participate in another virtual summit if travel restrictions were in place but 87% would prefer an in-person meeting if this was not the case.

Participants liked the layout of the schedule with the most common feedback being “good length, number, and structure.” However, participants also noted that they were unexpectedly pulled into emergency operations/patient care at times and appreciated having the sessions recorded for this reason. The most common recommendation for improvement was having small group breakout sessions to facilitate discussion. The most common challenge regarding the schedule was coordination in outside time zones. This was especially challenging for those in Europe and Australia/New Zealand.

In terms of technical limitations, 6 (13%) of participants had difficulty connecting, 17 (37%) experienced poor audio quality with the most common concern being inability to hear the speaker due to speaking softly/lack of volume. Of note, speakers were specifically asked to refrain from using mobile telephones and tablets when presenting; laptop computers were acceptable.

**DISCUSSION**

**Making the Decision to Go Virtual**

Given the moratorium on travel and safety concerns with mass gatherings, the CWIS Executive and Educational Committees had to make a decision regarding cancelling the Summit, postponing it, or moving it to an online platform. Factors to consider in making this decision included financial ramifications to the Society,

| TABLE 1. Respondents’ Views of In-Person versus Virtual Meetings |
|------------------|------------------|------------------|
| Prefer In-person Meeting | Prefer Virtual Meeting | No Difference |
| Full engagement in educational activity (no overlap with professional/personal obligations) | 45 (75%) | 9 (15%) | 10 (6%) |
| Ask questions/make comments | 33 (55%) | 14 (23%) | 13 (22%) |
| Interaction with vendors/opportunity to learn about new products/technologies | 55 (92%) | 1 (2%) | 4 (7%) |
| Peer networking opportunity | 56 (95%) | 2 (3%) | 1 (2%) |
| Interruption to biologic/circadian clock | 14 (26%) | 20 (38%) | 19 (36%) |

**TABLE 2. Respondents’ Views of the Educational Content of the Meeting (n = 60)**

| Question                                                                 | Strongly Agree/Agree | Neutral | Strongly Disagree/Disagree |
|--------------------------------------------------------------------------|----------------------|---------|---------------------------|
| I can better discuss relevant research projects                           | 54 (90%)             | 5 (8%)  | 1 (2%)                    |
| I can review current scientific projects in selected locations to generate ideas and collaborations | 50 (83%)             | 9 (15%) | 1 (2%)                    |
| I can assist in site-specific implementation processes allowing learners to contribute to an outcomes database | 44 (73%)             | 14 (23%) | 2 (3%)                    |
| I can compare/contrast the benefits/pitfalls to intrathoracic SSRF        | 52 (87%)             | 5 (8%)  | 3 (5%)                    |
| I can contemplate opportunities for improved leadership skills based on experiences presented | 46 (77%)             | 10 (16%) | 4 (7%)                    |
| I can analyze illustrative cases across the learning continuum from novice to advanced healthcare professional in chest wall injury | 52 (87%)             | 7 (12%) | 1 (2%)                    |
educational ramifications to the members, and workload ramifications to the staff and leadership. This is very similar to the decision made by the Association of Program Directors Society (APDS), whose meeting was to be held in Seattle, Washington at about the same time.  

The financial ramifications of cancelling the Summit involved both the need to offer a refund of registration fees collected as well as a refund of fees collected from industry sponsors and vendors. As with all societies and organizations, the annual meeting represents a significant portion of the annual revenue cycle. Thus, cancelling the meeting presented significant financial challenges. Similarly, postponing the meeting ran the risk of unclear pandemic timelines with recurring vendor fees and risk of complete financial loss as well as potential conflict with other in-person meetings that were scheduled for later in the year. With a virtual meeting, members were offered the chance to cancel their registration but only 3 did so. As well, the industry sponsors and vendors agreed to a virtual exhibit hall with time built into the schedule for registrants to interact with them, with only 1 organization decreasing the level of their financial contribution. This allowed for financial stability of the Society. The industry support prospectus had to be re-written, including adapting the options and features available for each respective level of financial contribution, in order to create and/or maintain return on investment for the industry support companies.

From an educational perspective, the membership derives updated information regarding chest wall injury and a significant number of continuing medical education hours from the annual Summit. As well, the Summit presents an opportunity for residents, fellows, and junior attending to present their work. This is important both to obtain notoriety within the field as well as for career progression. Thus, cancelling the meeting would have had negative impact on these member benefits, which would have violated the CWIS mission. Moving the meeting to an on-line platform allowed us to keep the majority of educational content that was already planned and allowed investigators to present their work.

The workload for staff was significant for a virtual summit. The schedule had to be completely reorganized (Figure 1). Staff had to work closely with information technology representatives to ensure that a stable platform was available for the meeting and that all participants, speakers as well as audience members, knew how to access the meeting. Whereas cancelling the meeting would have obviated this workload, CWIS leadership felt that the aforementioned benefits of making the Summit a virtual meeting justified the workload needed to implement it.

**Process and Format**

There are 3 main challenges in organizing an online meeting: establishing the online platform, scheduling of events (taking into account time zone differences), and informing both the faculty and the audience on how to enter/exit the virtual meeting.

There are multiple styles of virtual meeting platforms. The decision was made to use a broadcasting tool rather than a meeting platform. The key feature in a broadcasting tool is its similarity to a television channel, i.e., it is

| Time     | Event Description                        |
|----------|------------------------------------------|
| 0800 – 0805 | Welcome and opening remarks               |
| 0805 – 0900 | Plenary Talk                              |
| 0900 – 0930 | Break                                    |
| 0930 – 1030 | Scientific Session #1 (4 presentations)  |
| 1030 – 1100 | Panel Discussion                          |
| 1100 – 1300 | Break/Lunch                              |
| 1300 – 1400 | Scientific Session #2 (5 presentations)  |
| 1400 – 1430 | Resident Research Fellowship Awarded     |
| 1430 – 1445 | Break                                    |
| 1445 – 1600 | Panel Discussion                          |
| 1600 – 1630 | Panel Discussion                          |
| 1630       | Adjourn                                   |

**FIGURE 1.** Block schedule for each day. Note: The same schedule was followed on day 2 of the meeting.
pushed from a central location, not designed for 2-way audio interaction between presenter and audience. There can be multiple contributors to this feed, however, they must be predetermined and specifically invited to be part of the broadcast prior to the start of the session. This style allows for increased security with no chance for any unintended users usurping the feed (“meeting bombing”) and for better viewing quality; however, it also increases the level of scrutiny in planning as last-minute changes to presenterscontributors are not easily implemented. It also means that the only communication directly with the audience is via typed chat box questions and comments, which can be recognizably disengaging for some users, and does spontaneity between audience and presenter(s).

Since the meeting content was designed as a signal broadcast, there was no limitation to the number of users that could watch the content, except potential financial limitation of the CWIS in paying for enough user access. This afforded the option to allow sponsoring organizations complimentary registration for all of their employees who were already experiencing lighter than usual schedules anyway due to increased hospital visitation restrictions and decreased scheduled operations overall. This complimentary registration was widely popular with the sponsoring organizations, but additionally was also helpful to the Society in helping to inform representatives from main stakeholder organizations about the research occurring within CWIS. They, in turn, could share this information with surgeons who are not part of CWIS—a benefit that was valuable to both CWIS and sponsoring groups.

All presenters were required to join a training session 1 week prior to the virtual meeting in order to learn how to use the broadcast portal. This training was also recorded to allow any presenters who could not attend the live training sessions to be familiar with the platform.

One of the key features to the success of an online meeting is central coordination and the need for a command and control structure. This required weekly meetings of the Education Committee and meticulous chronicling of tasks to-be-done and those completed. This was done using both an asynchronous online workspace for communication and file-sharing. Additionally, the CWIS Executive Committee took on increased meeting responsibilities including communication to target audience, follow up with industry representatives to ensure financial stability of the meeting, and ongoing support for the Education Committee whenever needed.

**How the Meeting Was Carried Out**

Whereas the original in-person meeting was scheduled for 2.5 days, the online meeting was carried out in 2 days. Sessions were divided into 4 equal blocks with 1 break within each block and a longer lunch break between blocks (Figure 1). A generous lunch break allowed participants to manage extraneous tasks (e.g., clinical duties or attend to personal needs) that do not typically interfere with “in person” schedules. The keynote and invited lectures, as well as the panel discussions were maintained. Each of the scientific sessions was guided by a pair of moderators. As noted below, in order to maximize learning opportunities for participants across multiple times zones (including international), most discussions panels and pro/con debates were pre-recorded and participants were invited to watch them for up to 1 year following the meeting (asynchronous learning), while podium presentations were kept in a real-time format (synchronous learning). In total, 86 speakers from 14 times zones and 9 countries participated as faculty. Although we did not keep metrics regarding the number of people who logged on each day, it did not appear to the organizers that there was a difference in the number of participants between each day.

There was real-time, online technical support available at all times while the meeting was in session. A virtual speaker ready room was created for each session where speakers could enter, test their connection, re-learn how to use the speaker-only functions of the platform, and interact with the moderator prior to the actual presentation. Although it is possible to have audience participation via polls and other adjuncts, we maintained a question/answer format for simplicity. Questions were solicited from the audience using a typed “chat” area and chosen for discussion by the presenter by the session moderator. Similarly, although it is possible to have parallel sessions and/or break out rooms in a virtual meeting, we chose to maintain a single session format for simplicity in scheduling and technical management of the meeting.

In keeping with our desire to recreate the same educational experience with the virtual meeting, we maintained as much as possible the in-person agenda; however, this was a challenge due to schedule layout and technology limitations. Examples of needed-agenda adaptations include the following:

1. We did not have time to restructure the planned series of 8 CWIS University “hands on” sessions and, as such, they were removed from the program. The Education Committee evaluated options to keep these sessions, including using multiple cameras, shipping on-location equipment to registered participants, and prerecorded demonstrations. However, given the time between the decision to change from a live to virtual platform (approximately 6 weeks),
the expense and resources required were too great to maintain the sessions.

2. The next agenda adaptation involved use of prerecorded breakout sessions. These sessions were initially designed to be highly interactive and small-group style with appeal on a target-audience basis. These sessions were initially planned as 2 sets of 4 concurrently-running groups in the on-site agenda. However, in moving to an online forum, we recognized that the best opportunity for end-user viewing was through prerecorded sessions and allowing for asynchronous viewing at the scheduling discretion of the learner. As such, the sessions were all recorded in advance of the Summit. This approach provided the benefit of allowing all participants to view all of the sessions at their choosing, resolving the issues raised with having participants in multiple time zones, and obviating work that would be needed to create multiple synchronous virtual break out rooms. However, the results of our survey suggest that participants prefer small, real-time break-out sessions. This finding appears to be consistent with feedback obtained from the APDS meeting.7

3. An additional adaptation to an educational modality of our course was changing from traditional oral audience question/answer discussion at the end of each podium presentation to having a discussant with a moderated written question/answer format via the online “chat” function. The Education Committee was especially concerned about maintaining an appropriate level of discourse and debate. Discussants and moderators were instructed to facilitate a wide ranging discussion and to solicit a variety of questions from participants with diverse practice styles and backgrounds in order to foster discussion broadly. Because CWIS is a relatively new and small peer society, the moderators were familiar with most participants and felt that they could meet this goal.

4. During the final day of the on-site meeting, a live poster session with 40 presenters was planned. Although the Education Committee tried to identify creative strategies to facilitate this session during the virtual summit, it was not possible to fit this timing into the overall structure. The poster presenters were invited to record video clips of themselves performing their poster presentations and they were shared online with participants.

### Advantages and Disadvantages of an Online Meeting

There were 160 healthcare provider registered attendees at the 2019 CWIS Annual Summit. In 2020, the number of healthcare provider attendees was 275, but an additional 760 industry representatives took advantage of complimentary registration that was included as a part of their industry corporation sponsorship of the meeting. Because there was little added cost associated with having more participants, the CWIS Executive Meeting felt that the virtual summit offered an opportunity to reach out to trainees and to demonstrate gratitude to sponsors for their support of the virtual meeting. We did not keep a tally of the number of people who actively participated by asking questions as compared to those who only watched and listened to the talks.

There are many advantages to an online meeting (Table 3). First, the cost to organizers to put on the meeting is significantly lower than an in-person meeting. This cost-saving can be passed on to registrants, as we did in offering free registration to physicians in training. This benefit can allow a Society to expand its reach thereby raising its profile and, possibly, its membership. Similarly, the cost to participants is also significantly lower since the costs of travel are obviated. Third, registrants can attend to other duties and responsibilities, both professional as well as personal/familial, since they do not have to travel outside of their local environment, although this can be a liability as well as was noted in the participant survey we conducted. The benefits of membership in the Society can be promulgated by registrants who can invite their colleagues to the virtual meeting, although this can have negative financial ramifications as well.

However, an online meeting also has disadvantages as was noted in our participant survey. Use of the internet

### TABLE 3. Advantages/Disadvantages of an Online Meeting

| Advantages of Online Meeting | Disadvantages of Online Meeting |
|-----------------------------|--------------------------------|
| Cost saving to organizers   | Less networking opportunity   |
| Ability to stay at home with family | Potential for participants to be distracted with other activities/duties |
| Increased number of people who can attend a portion of the meeting/more registered participants | Requires high speed internet connection and updated computing equipment |
| Eco-friendly                | Technically challenging for those less facile with information technology |
| Travel-related cost saving to participants | More logistically difficult in terms of scheduling and coordination |
is subject to a reliable, high speed network being present and functional. Logging into the meeting may be problematic, especially in work settings where security measures may hinder the ability to log-in easily and reliably. This may be particularly challenging to participants who are not facile with computer technology. Next, whereas the cost of putting on an online meeting is lower for organizers, the task of doing so is much more complicated due to the need to meticulously schedule all events, to ensure that all participants know how to log-in, and to be available for just-in-time help when technical issues arise. While being at home affords the benefits noted above, it also has the disadvantage of allowing distractions, both work as well as personal in nature, which can detract from being able to attend the entire meeting. As well, there is no opportunity to gather socially and network, which, as previously noted, is key in career development as well as in fostering collaborative work. This need was better met in the APDS meeting, which utilized Zoom to try to create a social happy hour. However, this also introduced an element of complexity, which our meeting did not have.

Future Efforts
Our initial experience with a virtual meeting and the results of our survey suggest that a hybrid approach to future meetings may be ideal. Whereas survey participants felt that most educational goals were met (Table 2), they also stated that they nonetheless preferred the educational and networking environments associated with in-person meetings (Table 1). Issues that now need to be addressed include the ability of industry to support virtual meetings and the return on their investment for doing so. This question will directly impact the cost of putting on a virtual meeting, particularly one that involves a more sophisticated agenda, such as use of high definition streaming for demonstration of surgical techniques and coordination of breakout rooms amongst a large number of meeting attendees, than our did. Societies and program committees need to be creative in devising content that is educational to the attendees who are watching the meeting online and beneficial to the sponsors of the meeting. Yet, the lower travel cost and time associated with virtual meetings is also enticing. As such, societies may want to consider either offering both platforms simultaneously or perhaps alternating them each year. Depending on the magnitude of cost savings associated with a virtual platform, the savings could be passed on to members either in terms of lower membership fees or enhanced programs and benefits. These are decisions that will have to be made by each society based on their resources and members’ needs and wants.

CONCLUSION
Carrying out an online, real-time scientific meeting is both feasible and practical. However, an in-person meeting has more educational and networking value to local participants. A virtual meeting may have more value to worldwide participants, but this possible benefit requires more investigation.

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