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Authors

Li, Yi
Calle, Claire de la
Chu, Carissa
[et al.](#)

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CASE-based and Guidelines-based Lectures are the Most Preferred Form of Online Webinar Education: Results from the Urology Collaborative Online Video Didactics Series (COVID)

Yi Li, MD, Claire de la Calle, MD, Carissa Chu, MD, Caitlin Baussan, MD, and Lindsay A. Hampson, MD, MAS

Objective To evaluate the most preferred style of online didactic lectures. The COVID-19 pandemic has had a significant impact on surgical resident education, instigating a major shift towards online webinar didactics as a major of resident teaching. We hypothesize that a case-based format of online didactics are the most preferred format for this style of lecture.

Study Design We analyzed viewer evaluations following 82 online hour-long lectures in the Urology Collaborative Online Video Didactics Lecture Series. We categorized each lecture as case-based, guidelines-based, practice updates, or surgical technique-based and assessed viewer responses to survey questions regarding subject area relevance, lecturer knowledgeability, lecturer effectiveness, and usefulness to learning. We performed logistic regression to control for viewer level, instructor level, and lecture topic, and using surgical technique-based lectures as the baseline variable.

Results 2176 evaluations were analyzed. Case-based, guidelines-based and practice updates were all scored significantly higher than surgical technique for subject area relevance. Case-based and guideline-based lectures scored significantly higher for usefulness to learning. Case-based lectures scored significantly higher for lecturer effectiveness. There was no significant difference in scoring between any lecture style when rated on lecturer knowledgeability.

Conclusion When preparing online webinar based didactics for surgical resident education, case-based lecturers appear to be the most preferred and well received lecture style, followed closely by guidelines-based lectures. Practice updates and surgical technique-based lectures are less preferred formats for this teaching modality. UROLOGY 158: 52–56, 2021. © 2021 Elsevier Inc.

The 2019-2020 coronavirus pandemic has had a significant impact on all aspects of healthcare. One major shift has been an acceleration of the trend towards telehealth and remote meetings.¹ Surgical residency training programs likewise have moved towards web-based learning, surgical simulators, and remote clinics.² Otolaryngology and urology academic programs were among the first in the country to utilize these e-tools to optimize resident education via online didactic series as a response to the slowdown in resident education.^{3,4} Collaborative webinar series for both general resident education (i.e. Collaborative Multi-Institutional Otolaryngology Residency Education Program³, Urology Collaborative

Online Video Didactics Lecture Series, EMPIRE Lecture Series), and subspecialty specific topics (i.e. Peds URO-FLO, SMILES Series) were quickly developed and well received.⁵ While these programs were borne out of a need to supplement resident education, they have shown themselves to be a beneficial resource, allowing trainees access to experts in the field across the country, and bringing the academic urology community closer together.

With the success of these webinar lecture series and the ongoing nature of the pandemic, it appears that video didactics will be here to stay for the foreseeable future. Video didactics that have been recorded and remain free to access in various formats (Youtube, podcasts, etc.) can serve as an invaluable resource as they are maintained online for future trainees and learners. Given this trend, we aimed to identify if there are specific lecture styles that are better received by the viewers and trainees in this format. The Urology Collaborative Online Video Didactic (COVID) lecture series has broadcasted 98 lectures to date and has collected thousands of viewer evaluations. Lectures have varied both in content and in presentation style:

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From the Department of Urology, San Francisco, University of California, 400 Parnassus Ave A610, San Francisco, CA 94143

Address correspondence to: Dr. Lindsay Hampson, MD, MAS, Department of Urology, San Francisco, University of California, 400 Parnassus Avenue, Box 0738, San Francisco, CA 94143 E-mail: Lindsay.Hampson@ucsf.edu

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focusing on guidelines and basics, case scenarios, practice updates, and surgical techniques. We hypothesize that webinar lectures that focus on guidelines/basics, and case-based lectures will be rated higher than practice updates and surgical technique-based lectures by the viewers.

METHODS

Post-lecture online evaluations were offered to viewers after both live and recorded viewings. Lectures were evaluated on a Likert scale (1 = Poor, 2 = Below Average, 3 = Average, 4 = Above Average, 5 = Excellent). Viewers responded to questions worded as follows: 1) Subject area was relevant, 2) Instructor was knowledgeable in the content area, 3) Instructor's effectiveness in teaching the material, and 4) Didactic session was useful to my learning and education. Evaluations were collected and analyzed after the first two months of lectures, from 3/30/2020 to 5/30/2020.

Lecture style was categorized into guidelines/basics, case-based, practice updates, or surgical techniques based on the majority of the lecture content. Guidelines-based or basic lectures were categorized as such when the focus of the speaker was primarily on either American Urological Association/European Association of Urology (AUA/EUA) guidelines, or the most basic level of subject knowledge when guidelines were not available. Lectures were categorized as case-based if the majority of the lecture was centered around case scenarios or index patients. Practice update style lectures were categorized as such when the majority of the lecture focused on new clinical and research updates in the field. Lectures were categorized as surgical technique if the majority of the lecture focused on surgical techniques, including videos, outcomes, and complications. This categorization was made by three PGY5 urology residents at the University of California, San Francisco independently, and then compared.

Instructor faculty level, lecture topic category, and viewer training level data were collected and evaluated. Instructor levels were categorized as assistant, associate, full professor or other. Lecture topic was broken down to general, oncology, reconstructive/transgender, pediatric, minimally invasive/stone, female/neuro-urology, and andrology/infertility. Viewer level was categorized as medical student, junior resident (PGY1-PGY3), senior resident (PGY4-PGY7), fellow, and practicing provider (physicians and advanced practice providers).

Univariate analysis was performed using one-way analysis of variance to evaluate the association between lecture style and lecture rating for each rating category. Multivariable analysis using ordinal logistic regression was performed to evaluate the association between lecture style (with surgical technique as the reference group) and lecture rating for each category, controlling for lecture topic, instructor level and viewer level. Stata/SE 16.0 software was used for analysis with a p -value < 0.05 deemed statistically significant. Biostatistical consultation was utilized through the UCSF Clinical and Translational Science Institute. This study was evaluated by the institutional review board at the University of California, San Francisco and approved as exempt due to the educational nature and minimal risk of this study.

RESULTS

A total of 2176 post lecture evaluations were collected for the 82 COVID lectures broadcast between 3/30/2020 and 5/30/2020.

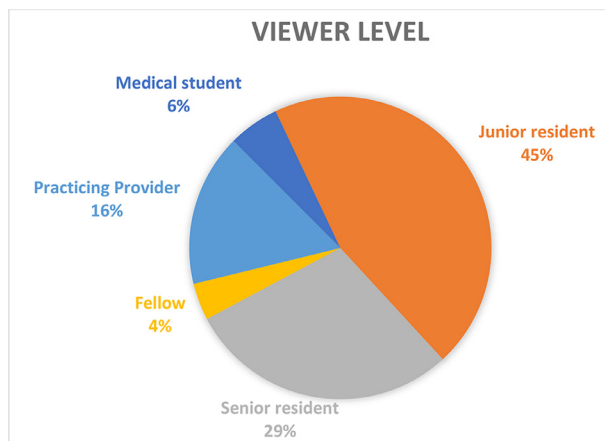


Figure 1. Percent breakdown of self-reported education level of viewers who submitted post-lecture evaluations in the COVID lecture series following the first two months of lectures. (Color version available online.)

1595 evaluations were done after watching the lecture in real time, and 565 after watching the video recording. 96 evaluations were completed by medical students, 799 by junior residents, 516 by senior residents, 70 by fellows, and 290 by practicing providers (Fig. 1).

Of the 82 lectures broadcast by the end of May 2020, 33 were by assistant professors, 17 by associate professors and 23 by full professors. Ten lectures were categorized as general urology, 18 as oncology, 10 as reconstructive/transgender, 18 as pediatric, 7 as minimally invasive surgery/stone, 10 as female/neuro-urology, and 9 as andrology/infertility. Of the lectures, 37 were categorized as guidelines/basics, 12 were case based, 24 were practice updates, and 9 were surgical technique-based (Fig. 2). Out of the 82 lectures categorized by the three residents, only 2 lectures were not unanimously categorized by all three reviewers. The two lectures were categorized via majority consensus.

On univariate analysis, lecture style was found to be significantly associated with ratings for subject area relevance ($P = 0.001$), instructor effectiveness ($P = 0.007$), and usefulness to learning ($P = 0.001$) but was not significantly associated with instructor knowledgeability. Overall, guidelines-based and case-based lectures received higher ratings than practice updates and surgical technique lectures across all rating categories (Fig. 3).

In multivariate analysis of subject relevance ratings by lecture style, guidelines-based (OR 3.89, CI 2.31-6.56), case-based (OR 3.58, CI 1.71-7.49), and practice updates (OR 2.42, CI 1.31-4.49) all scored significantly higher than surgical techniques. For lecturer effectiveness ratings, only case-based lectures (OR 2.81, CI 1.26-6.26) scored significantly higher than surgical technique. For usefulness to learning, both guidelines-based (OR 1.81, CI 1.08-3.05) and case-based lectures (OR 4.96, CI 2.21-11.14) scored significantly higher than surgical technique. There was no significant association between lecturer knowledgeability scores and lecture styles (Table 1).

DISCUSSION

In recent decades, there has been a shift towards utilizing the virtual classroom and “new media” in resident education.⁶⁻⁸ In undergraduate medical education, there has

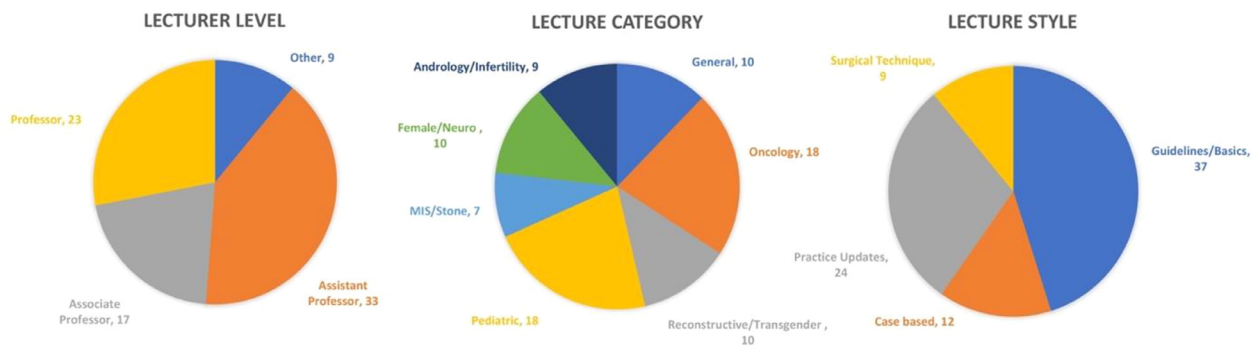


Figure 2. Breakdown of the 82 Urology COVID Series lectures by lecturer level, lecture category, and lecture style. (Color version available online.)

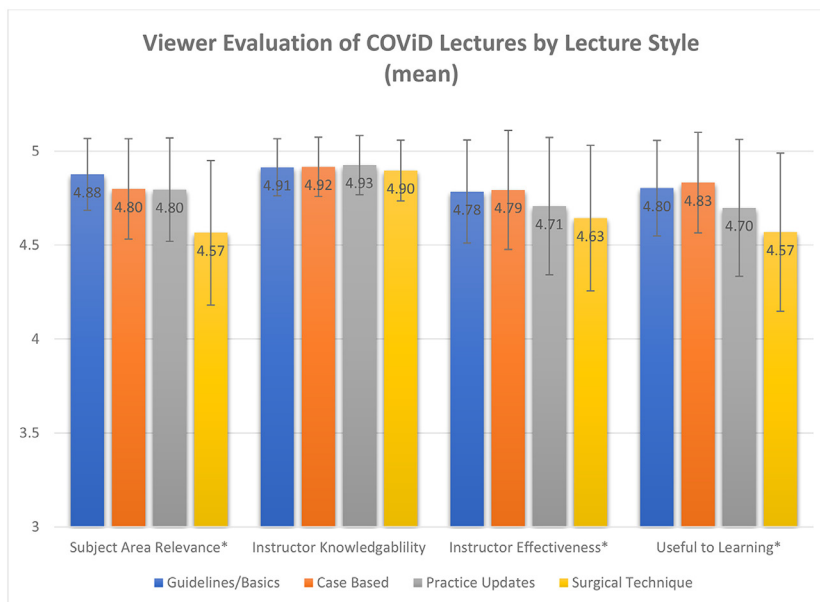


Figure 3. Average viewer evaluation results by lecture style. Error bars indicate standard deviation. Asterisk indicates statistically significant differences between the lecture styles on bivariate analysis. (Color version available online.)

been a well-documented major shift towards watching recorded lectures instead of attending live lectures.⁹ The COVID-19 pandemic drastically hastened the transition to virtual classrooms and collaborative video didactics in surgical residency training, and online and video learning appears to be here to stay for the foreseeable future.¹⁰

The difficulties presented by online didactics include the limited attention span of passive learners¹¹, variability in lecture styles that may not suit each learner, and variation in level of information.¹² The COVID Lecture Series was one of the earliest programs to adopt streaming

webinar format for resident education nationwide and as such offers us a chance to understand how to best present virtual education in the future.

Case-based lectures overall scored highly in all categories. Decades of medical education research have outlined the effectiveness of both problem-based curricula¹³ and the utilization of media and discussion beyond the conventional lecture format.¹⁴ While webinar lecture series are limited in being able to incorporate small group discussions and multi-modal learning, case-based scenarios and case-based lectures are the closest they can get to the

Table 1. Multivariate analysis of varying lecture styles by each survey category controlling for lecture topic, viewer level, and lecturer level. Surgical Technique scores used as reference group for analysis.

Table 1	Guidelines Based		Case Based		Practice Updates	
	OR	95% CI	OR	95% CI	OR	95% CI
Subject Area Relevance	3.89	2.31-6.56	3.58	1.71-7.49	2.42	1.31-4.49
Lecturer Knowledgeability	1.09	0.51-2.35	1.63	0.55-4.87	0.94	0.39-2.27
Lecturer Effectiveness	1.43	0.82-2.49	2.81	1.26-6.26	0.99	0.53-1.88
Usefulness to Learning	1.81	1.08-3.05	4.96	2.21-11.14	1.19	0.65-2.17

“flipped classroom” model. Therefore, it is unsurprising that the case-based style of lecture was rated significantly higher than the other lecture styles in terms of subject relevance, lecturer effectiveness, and usefulness to learning. Prior survey studies have shown that trainees feel case-based learning in urology is effective for improving both clinical care and knowledge base.¹⁵ In the COVID series, lectures utilized case scenarios to teach both guidelines and basics in the “index patient” model, as well as to create a more interactive learning environment.

Guidelines-based or basic lectures also scored well overall and were found to have significantly higher ratings in terms of subject relevance and usefulness to learning compared to surgical techniques. While graduate level medical education has seen a shift away from this model of lecture, it remains the staple format for most didactics and junior trainee level learning.¹⁶ As an educational resource primarily directed towards resident-level education, and with the majority of viewers self-reporting to be junior residents (Fig. 1), a format that focuses on basics and guidelines understandably rates well in terms of subject area relevance and usefulness to learning. While this style of lecture does not utilize the “flipped classroom” model, it can remain interactive with use of poll questions, videos, and discussion to engage learners and provide “active” learning opportunities.

Practice update style lectures are similar in concept to plenary sessions at region and national meetings, often focusing on more advanced information. The style may assume a level of baseline knowledge by the viewer. For example, the Urology COVID lecture on prostate cancer screening discussed the latest epidemiology of prostate cancer, trends in racial disparities, and details on the newest genomic testing. This lecture was categorized as a practice update as it assumed baseline knowledge of PSA testing and early detection guidelines. In our analysis, practice update lectures scored better than surgical technique in terms of subject relevance, but in terms of lecturer effectiveness and usefulness to learning it did not score any higher. Previous studies have noted that lectures where the information is too abundant or advanced were more difficult for learners to appreciate.¹² Practice update lectures may have fallen into this pitfall, where the assumption of basic understanding of the viewer was overestimated. While viewer level was controlled for in this analysis, 80% of the viewers were resident level or below. Lectures focusing on practice updates and new studies should take care to know the audience and explain basic principles that are necessary to understanding the new findings being discussed.

Finally, surgical technique lectures overall fared the poorest and were the lowest rated in each evaluation category. Only 9 out of the 82 lectures during the study period were categorized as surgical technique, and the majority focused on techniques and surgeries that were either not commonly performed at all residency programs, or were rarely seen, such as transgender surgery or pediatric robotic surgery. The fact that these topics are less routine in

nature and more uncommon in practice may explain the decreased rating for “subject area relevance” even when controlling for overall lecture topic. This may be an implicit deficiency in this style of lecture, as speakers are less likely to present surgical technique lectures for the more common urologic surgery experiences. Surgical training programs have explored using virtual and e-learning to teach surgical technique, specifically utilizing robot and laparoscopic simulators.¹⁷ However, surgical technique education in a webinar format does not give the learning, the feedback and physical experience that a simulator can provide.¹⁸ There is still likely a significant gap in learner experience between virtual surgery simulation and the operating room setting.

Limitations to our study include the categorization process of lectures. We attempted to mitigate this by having three residents categorize them independently, but there was no way to blind the resident to the lecture topic or speaker in this process. However, there was a high level of concordance between the raters. While we were able to categorize the lectures, we did not report on the “interactivity” of lectures that may underlie ratings. Case based lectures are inherently interactive, but other lecture formats can increase learner engagement by utilizing polling questions, discussions, and other techniques. There were no significant differences noted when we compared evaluations between live lecture viewers (who could interact with poll questions and chat) and viewers who watched the recording. This is something that can be further investigated in future studies.

Additionally, the surveys distributed were created with quality improvement in mind, and not specifically for the purposes of this study. Wording and validation of the survey could have been improved during study design. We did not evaluate the efficacy of the lecture styles with regard to learner knowledge retention, i.e. pre and post testing. Thus, the effectiveness of the lectures were evaluated via subjective viewer feedback, which may be subject to bias from multiple sources.

Finally, while we do find statistical significance on univariate and multivariate analysis, the actual difference in average scores between the four lecture styles remains less than a point for each question (Figure 3). This is likely due to the overall positive reception of this lecture series as a whole.¹⁰ Therefore, the clinical significance of these findings remain open to interpretation. Readers should not interpret from this study that practice update lectures or surgical technique-based lectures are not beneficial styles of webinar lecture, but rather utilize this data to better incorporate multiple lecture styles and techniques to improve the effectiveness and usefulness of these webinars.

There will be lecture topics that are better suited to various styles and learners, and the end goal should be to produce the most effective and palatable learning experience for the viewer as possible. In this new era of shared learning and webinar-based didactics, incorporating guidelines and basic knowledge into a case-based format

seems to be the highest yield for resident learners, though further analysis of the most effective ways to teach urologic content will be an integral aspect of the progression of academic urology into the future.

CONCLUSION

In the new era of online web-based learning for surgical resident education, understanding the most effective way to deliver online lectures to large resident audiences has gained increased importance. Our study shows that case-based and guidelines-based styles of lectures are the best received by viewers in this format when controlling for lecture topic, speaker, and viewer. Lecture styles will inevitably be influenced by lecture topic and lecturer preference. However, lecturers should take into account these viewer-reported preferences when preparing for resident-based webinar lecturers.

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