Audience response system: a new learning tool for urologic conferences

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Introduction: *Audience response systems (ARS) have not been used to gauge knowledge transfer and retention in the setting of large medical conferences. In this study, we explore the utility of an ARS as an educational tool in the setting of a large urology conference.*

Materials and methods: *At the 2011 joint meeting of the Mid-Atlantic and New England sections of the American Urological Association, conference attendees were able to use a web-based and cell-phone accessed ARS. At the meeting, six ARS questions were asked during five point-counterpoint debate topics covering areas of prostate cancer, incontinence, pediatrics, stone disease, and renal cancer. Questions were presented by expert representatives from each of the sections; questions were structured as management options for predefined cases. At the beginning and end of each 15-minute session, attendees were asked to use the ARS to select the best management option.*

Results: *In five out of the six questions (83%) more than 10% of responses were changed following the presentation of the point-counterpoint session and a > 25% change in response was noted in two out of the six questions (33%). A statistically significant change was noted for one question relating to management of urolithiasis in pregnancy ($p = 0.037$).*

Conclusions: *This is the first study which demonstrates the potential utility of an ARS in a large urology conference. With further research it may be possible to use this technology to identify high-yield topics for medical education and improve outcomes during lecture-based educational activities.*

Key Words: urology, audience research, medical education, conferences

Introduction

Currently, the majority of post-residency continuing medical education (CME) occurs through attendance at large medical conferences.[1,2] CME credits are often awarded for mere attendance at conferences or based on follow up surveys. However, these methods do not objectively measure acquired knowledge. In a Cochrane review of effects of CME conferences on professional practice and outcomes, the authors determined that conference attendance can improve healthcare outcomes, but the improvement is very small. Furthermore, the study determined that meetings that incorporate a mix of both pure didactic as well as interactive sessions are more likely to impact clinical practice.[3]

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The audience response system (ARS) can have a positive impact on teaching and learning in various educational arenas. Use of an ARS has been shown to enhance learning and maintain attention in students while allowing a degree of anonymity.[4,5] Its use in resident lectures and case-based conferences may improve learning outcomes and facilitate long term retention of material through heightened attention and lecture enjoyment.[6-10] Incorporating an ARS into didactic material may also offer a more interactive and engaging way to present information.[9]

Use of an ARS has been particularly useful in the role of CME as it has been shown to improve participant activity and attention, and as a result, has a greater potential to effect change in clinical practice.[1,2] However, the utility of ARS technology in the setting of a large urology conference has never been objectively studied. Therefore, the purpose of this study was to evaluate the utility of an ARS in the setting of a large urology conference to measure audience knowledge and attitudes regarding high-yield clinical topics.

TABLE 1. **Six audio response system (ARS) questions structured as management options for predetermined cases were asked during five point-counterpoint debate topics covering various areas of interest. Audience members used the ARS to choose the best management option before and after each session**

ARS question	Case	Management option 1	Management option 2
1	An otherwise healthy 65-year-old man had a radical prostatectomy which revealed Gleason 3 + 4 prostate cancer, stage PT2c with positive margins	Adjuvant radiation	Salvage radiation if PSA becomes detectable
2	A patient has moderate urinary incontinence 1 year following radical prostatectomy	Male perineal sling	Artificial sphincter
3	An infant presents with unilateral severe obstruction at the uretero-pelvic junction	Robotic pyeloplasty	Open pyeloplasty
4a	A 26 week pregnant woman with a history of nephrolithiasis presents with flank pain	Low dose CT	Ultrasound
4b	You identify a 6 mm obstructing stone on imaging	Stent until after delivery	Immediate ureteroscopy
5	A 65-year-old otherwise healthy man presents with a 2.5 cm enhancing renal mass on CT	Renal mass biopsy	Observation or intervention without biopsy

Materials and methods

Participants

Participants included individuals who attended the 2011 joint meeting of the Mid-Atlantic and New England sections of the American Urological Association (AUA). Varying numbers of attendees participated in point-counterpoint debates using the ARS web-based system. A feedback survey was offered at the end of the meeting to gauge overall attendance and interest in sessions.

Study design

The study was approved by the institutional review board at the Virginia Commonwealth University School of Medicine. At the 2011 joint meeting of the Mid-Atlantic and New England sections of the AUA, conferences attendees were able to use a web-based and cell-phone accessed ARS. The system was available as a paid service from surveyanywhere.com. The website required preloading of questions that were presented during the meeting. Identical questions were displayed on-screen both before and after the presentation of point-counterpoint topics by recognized experts in each of the participating AUA sections. Participants were asked to text their responses with near immediate and anonymous feedback displayed graphically on-screen. A total of six ARS questions were asked during five point-counterpoint debate topics covering areas of prostate cancer, incontinence, pediatrics, stone disease, and renal cancer. Participants were asked to choose between two management strategies for predetermined cases. Table 1 lists the complete ARS questions and management options.

Statistical analysis

Survey data were compiled from internet-based ARS system and integrated into tabulated data using Excel. Categorical data were compared using Fisher's Exact tests. Data are reported using percentage change. Statistical significance was achieved with two-tailed p values < 0.05.

Results

A total of 339 unique ARS responses were completed during the conference including 182 prior to the point-counterpoint presentations and 157 after the completion of the presentations. The total cost of

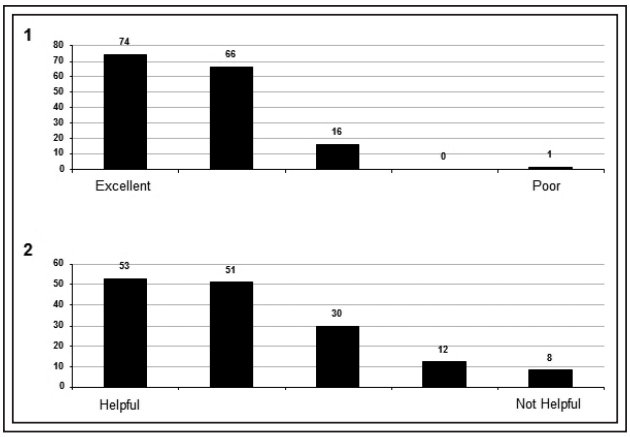

Figure 1. Attendees were asked to fill out a survey at the end of the conference. Attendees were asked to rate the overall quality of the point-counterpoint sessions (1), and if they thought the ARS was helpful (2).

the web-based survey system was $65 for the entire urology meeting. In addition, 163 individuals who attended the 2011 joint meeting of the Mid-Atlantic and New England sections of the AUA participated in a post-meeting on-line survey completed as part of the CME credit process. Of those who filled out the post-meeting survey, 87.3% stated that they attended topic #1 on prostate cancer, 65.3% attended topic #2 on incontinence, 36.7% attended topic #3 on pediatric urology, 59.9% attended topic #4 on stone disease and endourology, and 79.4% attended topic #5 on renal and urothelial cancer. The majority of attendees felt the point-counterpoint sessions were excellent or near-excellent (89.2%). Overall, the use of an ARS during these sessions was perceived as helpful (67.5%). A complete distribution of participant responses is shown in Figure 1.

The results from the six ARS questions pre- and post-presentation are shown in Figure 2. In five out of the six questions (83%) more than 10% of responses were changed following the presentation of the point-counterpoint session, and a > 25% change in response was noted in two out of the six questions (33%). A statistically significant change was noted for one question relating to management of urolithiasis in pregnancy (question 4b: p = 0.037).

Discussion

In this study, we demonstrated the feasibility and utility of incorporating an ARS in a large urology conference as an educational tool. The system was inexpensive and easy to implement, and was received favorably by 67.5%

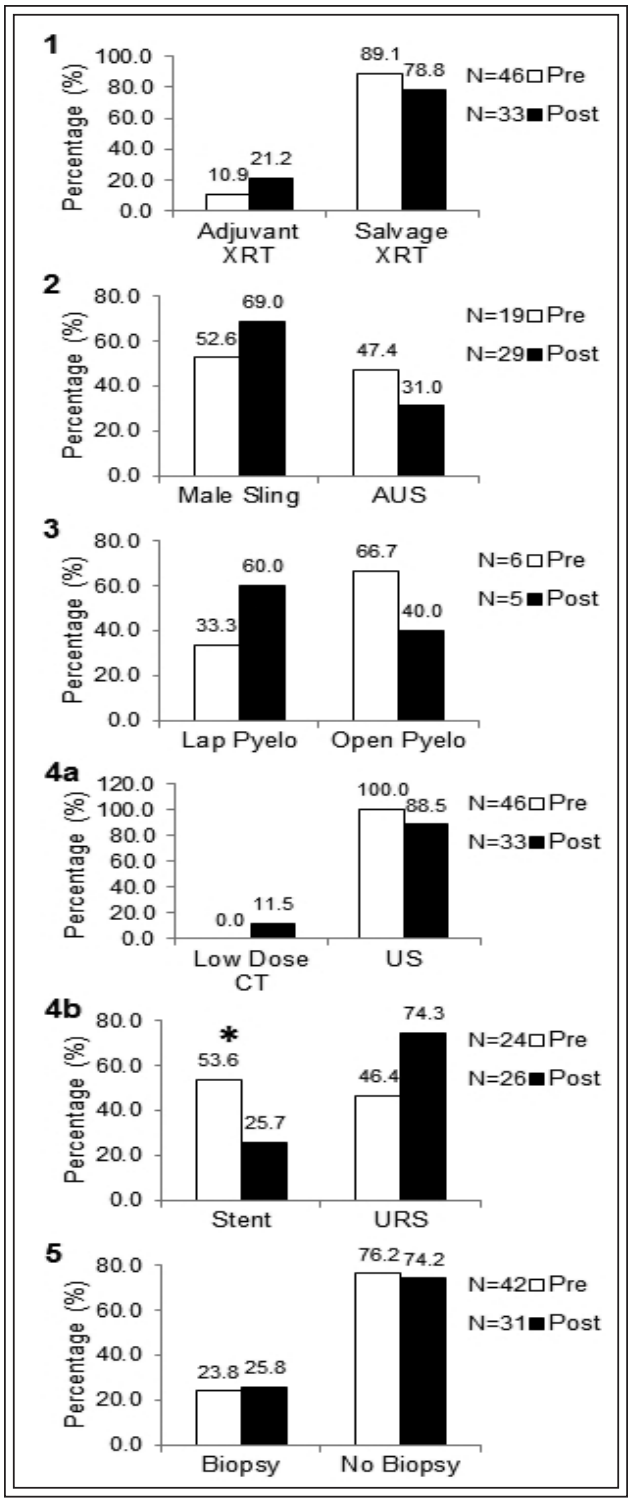

Figure 2. An ARS was used to assess opinions about treatment options for scenarios presented as point-counterpoint presentations (1-5). Attendees gave answers to the same question pre- (white) and post-presentation (black). Significant answer changes were noted for topic 4b (*p = 0.037).

of conference participants. The ARS was able to show changes in audience responses after the presentation of point-counterpoint sessions, allowing meeting organizers to gauge baseline attitudes and knowledge as well as the potential effectiveness or persuasiveness of the lecturers.

In five out of the six ARS questions presented in this study, a > 10% change in pre- and post-lecture responses was noted. Most notably, there was a statistically significant change in in question #4b, regarding the management of an obstructing ureteral stone in a pregnant woman. The magnitude of change may indicate the need for further discussion or education in that particular area. On the other hand, the small 2% change in responses for question #5 may suggest that most conference attendees were well-versed in the use of renal biopsy in the management of a small renal mass.

The use of ARS technology not only improves audience attitudes toward lectures but also offers a unique opportunity for immediate feedback to both the presenter and audience.[4,8,11] ARS have been used with students to improve motivation, build confidence, and provide feedback.[4,5] Knowing the benefits of this technology, it is surprising that data is limited on the use of ARS in large conference CME activities where the majority of post-residency education occurs.[1,2]

The ARS has also been shown to be beneficial in resident education. Studies have shown that residents have improved attitudes and attention toward required lectures when an ARS is incorporated.[8] Residents have better long term retention of material with the use of an ARS.[9] Despite the benefits of an ARS, it remains an underutilized tool in the educational arena largely due to a lack of information needed to actively incorporate this technology.[6] Other concerns may include the cost of implementation of ARS technology.

This study has several limitations. With this cell phone accessed internet-based ARS, it was not possible to track individual responses and therefore not possible to examine the effect of the point-counterpoint sessions on individuals' opinions. Although there was a change noted in responses, the small sample size of the study limited the amount of statistically significant data. Additionally, some participants found this particular ARS difficult to use or indicated there was a lack of instruction on how to use the system. The difficulty in using the ARS may account for the discrepancy in participants' pre- and post-presentation responses. Use of individualized handsets with adequate instruction on use in the future may improve results. In spite of these limitations, the study demonstrates that ARS technology can be directly incorporated into a large urology conference and used to objectively gauge attitudes, audience participation, and learning.

Conclusions

This is the first study which demonstrates the potential utility of an ARS in a large urology conference. With further research it may be possible to use this technology to identify high-yield topics for CME and improve outcomes during lecture-based educational activities. Incorporation of ARS allows for the potential to identify important topics in urology and improves the likelihood of large conferences to effect change in professional practice. Further research can be undertaken to determine whether ARS-related learning activities can be directly linked to improved clinical outcomes. □

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