

# Physician engagement in regularly scheduled rounds

## Participation des médecins aux séances scientifiques planifiées

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### Abstract

**Background:** Physician participation in regularly scheduled series (RSS), also known as grand rounds, was explored with a particular focus on physician perceptions about the elements that affected their engagement in RSS and the unanticipated benefits to RSS.

**Methods:** A qualitative study using semi-structured interviews and thematic analysis examined physicians' perception of their knowledge and educational needs and the factors that contributed to engagement in their local hospital RSS.

**Results:** Physician engagement in RSS was affected by four major themes: *Features that Affect the RSS' Quality*; *Collegial Interactions*; *Perceived Outcomes of RSS*; and *Barriers to participation* in RSS. *Features that Affect RSS' Quality* were specific modifiable features that impacted the perceived quality of the RSS. *Collegial Interactions* were interactions that occurred between colleagues directly or indirectly as a result of attending RSS. *Outcomes of RSS* were specific outcome measures used in RSS sessions. *Barriers* were seen as reasons why physicians were unwilling or unable to participate in RSS. All of the elements identified within the four themes contributed to the development of physician engagement. Physicians also identified changes directly and indirectly due to RSS.

**Discussion:** Specific features of RSS result in enhanced physician engagement. There are benefits that may not be accounted for in continuing medical education (CME) outcome study designs.

### Résumé

**Contexte :** Nous examinons la participation des médecins aux séries de conférences planifiées (SCP) planifiées à l'avance, également connues sous le nom de séances scientifiques, plus particulièrement sous l'angle des perceptions des médecins quant aux éléments qui ont déterminé leur participation et quant aux avantages inattendus des SAR.

**Méthode :** La perception qu'ont les médecins de leurs connaissances et de leurs besoins de formation, ainsi que des facteurs qui les ont poussés à participer aux SCP de leur hôpital sont examinés par le biais d'une étude qualitative comprenant des entretiens semi-dirigés et une analyse thématique.

**Résultats :** Les facteurs qui déterminent la participation des médecins aux SCP se classent en quatre grands thèmes : les caractéristiques qui affectent la qualité des SCP, l'interaction entre collègues, les résultats perçus des SAR et les obstacles à leur participation aux SCP. Les premières sont des caractéristiques modifiables précises, qui influencent la qualité perçue des SCP. Les secondes sont les interactions entre collègues qui se produisent directement ou indirectement à la suite de la participation à une SCP. Les résultats des SCP sont des indicateurs de résultats précis utilisés dans les séances d'activités régulières. Sont considérés comme obstacles les raisons pour lesquelles les médecins ne voulaient pas ou ne pouvaient pas prendre part aux SCP. Tous les éléments décelés de chacun des quatre thèmes ont contribué à favoriser la participation des médecins. Les médecins ont également trouvé des changements qui sont directement ou indirectement liés aux SCP.

**Discussion :** Certains traits spécifiques des SCP favorisent une participation accrue des médecins. Il est possible que les études de résultats du développement professionnel continu (DPC) ne tiennent pas compte de tous les avantages que les SCP procurent.

## Introduction

In recent years, there has been significant attention to maintenance of certification (MOC) for physicians.<sup>1-3</sup> Surveys of both Canadian and American physicians suggest that physicians have been dissatisfied with the quality of MOC programs available in both Canada and the United States<sup>1,3</sup> and have distinct preferences regarding the way in which they prefer to learn. While these preferences include point of care knowledge acquisition and internet learning, a substantial percentage of physicians still prefer traditional methods of educational delivery such as Grand Rounds or regularly scheduled series (RSS).<sup>4,5</sup> RSS enable physicians to maintain competence and incorporate new knowledge to improve quality care for patients and communities. As defined by the Accreditation Council for Continuing Medical Education,<sup>6</sup> RSS are series with multiple sessions that occur on an ongoing basis (offered weekly, monthly, or quarterly) and are primarily planned by and presented to the accredited organization's professional staff. These popular activities include Grand Rounds, Tumor Boards, and Morbidity and Mortality Conferences.<sup>7,8</sup>

There is a significant body of literature<sup>9-13</sup> that has investigated the efficacy and types of educational interventions, such as RSS, that result in change to a physician's practice. A meta-analysis by Cervero and Gaines,<sup>13</sup> concludes that continuing medical education (CME) is likely to improve physician performance and health outcomes and also summarizes the general characteristics of interventions that are likely to result in changes to health outcomes. They state that "CME that is more interactive, uses more methods, involves multiple exposures, is longer, and is focused on outcomes important to physicians lead to more positive outcomes."<sup>13</sup> They argue that while the literature is clear regarding the effectiveness of CME, the mechanisms of action that result in change are not clearly understood and the wider issue of social, political and organizational factors that result in changes need more study. Along these lines, prevalent CME studies that are narrowly focused on looking for measurable outcomes as pre-determined by the speaker or program planner<sup>10,12</sup> limits our understanding of the value of CME. Some authors argue that there are changes that result from CME that are unintended but equally beneficial to patient care that are not measured in the current studies.<sup>10,11</sup> In particular, Olson et al.,<sup>10</sup> point to specific cases whereby the knowledge to be transferred had little or nothing to do with the physician changes that resulted

from CME events. They argue that the perceived ineffectiveness of CME is due to many factors including: the framework used to assess effectiveness of educational methods; the prevailing theories of clinical practice change; and research methods used for effectiveness studies.<sup>10</sup>

Recently, some groups have begun to relook at the educational preferences and barriers to education for physicians, using national surveys, to help shape the future of CME.<sup>4,5</sup> While surveys are useful tools, they are limited to the questions that are asked and may not be the best methods to determine the mechanism of action of CME. Given that the desired and resultant changes from RSS may not always align, the open-ended nature of qualitative analysis may complement these approaches and be better positioned to help identify the features of CME that are the most likely to result in both expected and unexpected changes from a learner's perspective.

At present, there is a gap in knowledge about the needs of learners attending RSS and their perception of important elements that lead to practice change from a qualitative perspective. In particular, there is little qualitative research that guides us to the features of RSS that learners believe will result in practice change. Given that RSS is popular among physicians and may carry unmeasured benefits, it is important to try and explore the perceptions of physicians regarding RSS using a qualitative approach to help improve these activities. The purpose of our study was to explore physician participation in RSS with a particular focus on physicians' perceptions about the elements that affect their engagement in RSS and elements that they believe help them make changes in their work.

## Methods

We conducted a qualitative study using a thematic analysis<sup>14,15</sup> of semi-structured interviews to explore nephrologists' perception of regularly scheduled rounds.<sup>16,17</sup> We drew on constructivist grounded theory<sup>18-20</sup> techniques with a focus on participant experiences with RSS. The study was approved by the University of Calgary Conjoint Health Research Ethics Board. Informed consent was obtained from all individual participants included in the study.

### Setting

The interviews took place in private offices at the Foothills Medical Center (FMC), a tertiary care facility. Participants had access to four RSS: Nephrology City Wide Rounds;

Biopsy Rounds; Journal Club; and Research Rounds. Nephrology City Wide Rounds are weekly events whereby individual nephrologists present didactic lectures where most people attend at one location with other joining via video link to other sites. Biopsy Rounds are held twice monthly for nephrologists and pathologists and combine a didactic lecture with review of kidney biopsies. Journal Club is a monthly activity bringing together nephrologists and residents to discuss topical articles. Research rounds are twice monthly events where researchers present their research or research ideas to nephrologists and trainees.

### Participants

We conducted interviews with nephrologists in the Division of Nephrology. This Division was chosen as AB is a nephrologist member and had access to the group. The 25 practicing adult nephrologists included academic and private practice physicians with Canadian certification in nephrology. Many in the group had academic positions at the University of Calgary and varying involvement in academic and educational activities. All attended local CME/CPD. AB approached nephrologists to participate in an hour long interview by personal or email invitation. Maximum variation methodology involves purposefully choosing individuals to interview who are the most different in order to gain a variety of perspectives. We used this method to select individuals to obtain a mixture of perspectives based on leadership positions, gender, age and type of practice with purposeful sampling. All nephrologists who were invited participated and none of the participants withdrew from the study.

### Data collection

We developed an interview guide based on a review of the available evidence regarding physician preferences for RSS<sup>22</sup> and learning and change and learning theory.<sup>23</sup> Interviews were utilized to provide a confidential and individualized approach to data collection that would not be afforded by focus groups or questionnaires. The semi structured interview focused on knowledge, ideas and opinions about RSS were including physicians' likes, dislikes, strengths, weaknesses, preferences, the role of local education in their continuing professional development (CPD) and their opinion on what features would result in practice changes. Although specific probes were created in advance, probes were also generated at the time of the interviews based on participants' responses. AB performed all the interviews and the two initial interviews were also attended by JL for quality assurance purposes as thesis supervisor. All data was

recorded using digital audio recorders and transcribed after the interviews. Since data collection and analysis occurred concurrently, interviews continued until thematic saturation<sup>14,23</sup> had been reached after three new transcripts failed to demonstrate new or emerging themes.

### Data analysis

We used thematic analysis<sup>14,15</sup> to analyze the data. In addition to recordings, field notes were written during the interviews and memos were written upon review of the transcripts to keep track of themes and key ideas. The data were analyzed iteratively throughout the interview data collection. In the initial coding stage, AB and JL read the interviews line by line to determine specific codes arising from the interviews. Subsequently, we grouped these codes into potential themes that emerged from the data. Field notes and memos were reviewed regularly to provide additional context to the interviews to further elucidate themes or relationships. Interviews were transcribed by a professional transcriptionist immediately after they were conducted. After each group of two to three interviews, we adapted the existing coding structure and compared it to newly collected data to inform the refinement of the identified themes in an iterative fashion. We developed the preliminary coding structure which was discussed and refined by the entire research team. We created rules for inclusion into themes and as the coding progressed, earlier transcripts were re-analyzed to ensure their alignment with the evolving coding structure in an iterative and constant comparison fashion. Once all of the themes emerging from the interviews were identified, we looked across the data for themes that spanned thematic categories. At each stage in the process we reviewed the themes to ensure that they were still valid and represented the data. After each iteration of data collection and analysis, we re-examined the coding structure and AB entered it into QSR NVivo version 10.

We used multiple strategies to enhance trustworthiness and rigor in the data.<sup>16,20,24</sup> We recorded field notes and memos throughout the process. We created a coding structure and saved each iteration of the coding structure. All of the interviews were read by JL and themes were discussed. The other researchers reviewed selected transcripts and provided input into the coding framework. We prepared notes after every meeting. We held a peer review debriefing presentation of study findings at Nephrology City Wide Rounds.

## Results

Fifteen of the 25 Calgary nephrologists were interviewed (10 men and five women). There was a combination of both academic ( $N = 12$ ) and private practice physicians ( $N = 3$ ) as well as individuals in leadership roles within the University and the Hospital. Their individual characteristics are not detailed to maintain anonymity and prevent individual identification.

The thematic analysis identified four major themes perceived to affect engagement or the effectiveness of RSS. The themes included: (1) *Features that affect RSS' quality*; (2) *Collegial interactions*; (3) *Outcomes of RSS*; and (4) *Barriers to participation in RSS*. These four themes and their sub-themes are described below and were found to be inter-related through engagement. Engagement is described separately after these themes. This model is shown in Figure 1.

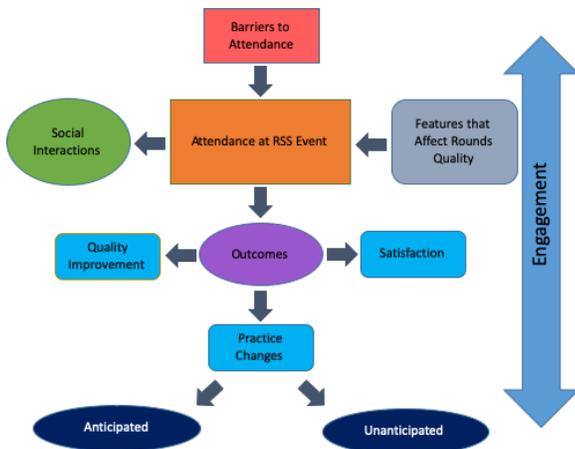


Figure 1. Model of physicians' perception of enhanced efficacy and engagement in RSS

### 1. Features that affect rounds quality

These are defined as specific modifiable features that impacted the perceived quality of the RSS. There were six sub-themes that also emerged in this section that participants specifically identified as features that lead to high quality rounds. Having access to and participating in rounds of high quality was seen as critical to success with physicians identifying a number of features that affected their notion about quality.

#### 1a. Case-based learning and clinically relevant events:

Nephrologists described how case-based and clinically relevant learning events enhanced their engagement, learning and practice change:

*I think that the discussion of a missed case of something treatable kind of you know stuck out in my mind. And so you know I re-evaluated my practice and what I am doing with those particular patients and making sure that you kind of being more systematic and to make sure nothing's missed. – P5*

**1b. Presentation quality:** The participants varied as to the particular aspects of what made up a high quality presentation. High quality presentations resulted in improved satisfaction and learning:

*Some people are great presenters and others are not necessarily. And improving presentation skills and the delivery of the information and really honing in on here's my key messages, here are the three points I am going to make to support it. And then working your way through a structured talk that really nails a point and there's some take away messages as opposed to here's, fifty five trials and kind of never coming around to what's the point. – P1*

**1c. Expert opinion:** Physicians described how expert opinion or key opinion leaders were valuable to their learning especially in areas where there was clinical equipoise or a lack of evidence:

*[Regarding a rounds with an world expert]...you know it was an opportunity to ask what do you do in these sorts of scenarios where there wasn't evidence...I actually remember, I remember I was contemplating re-biopsying someone with proteinuria afterwards and I asked him he said "well I've seen many patients like yours with low grade proteinuria and I tend to just follow them for longer" and it actually helped. It wasn't highly evidence based, but it reassured me that I didn't need to be more invasive than I was being at the time. – P3*

**1d. Active participation in the event:** Interviewees stated that active participation increased their learning and concentration during learning events:

*...I think it's because of the, you get to have a very interactive role with whomever the presenter is and your colleagues as well. And I think you are able to probe their knowledge a lot better when you are able to have a discussion around the table or around the conference room. – P10*

**1e. Personal learning preference:** The participants wanted CME providers to ensure that the format of local CME events was compatible with their personal learning

preferences and reported that events that were aligned with their learning preferences enhanced learning:

*And so I really think that's a wonderful way to learn. And I find myself challenged all the time at Biopsy Rounds. Because we tend to present you know either diagnostic or therapeutic challenges. So in terms of what I enjoy... it. I really enjoy that, if I had my way we'd probably do that every week because it's such a good learning experience. – P2*

Other interviewees described how some events were incompatible with their preferred learning strategies resulting in ineffective learning as a result:

*I personally don't learn well from when I sit in an audience and listen to a talk. I don't retain much and I have always been that way. So I was the kid in Medical School who never went to a lecture, I just read it myself. And so for me it really stimulates ideas that I might want to read about, I can't say I take a whole lot away from it most of the time. – P1*

**1f. Evidence-based:** Events that incorporated evidence-based medicine were very important in participants' interpretation of rounds quality and decisions to make changes in their overall practice:

I don't have time to read all the literature around all the areas of nephrology practice and so when an important topic is brought up and the evidence behind it is presented in a non-biased way then that's important for me. – P5

## 2. Collegial interactions

These were interactions that occurred between colleagues directly or indirectly as a result of attending RSS. One of the strongest themes emerging from the interviews was the importance of collegial interactions in CME. Participants described specific instances whereby they gained access to the knowledge and wisdom of their colleagues. These interactions included opportunities for peer consultation, networking, and social interaction.

Physicians repeatedly mentioned the opportunities for peer consultation to garner the opinions of their colleagues regarding the management of patients. These were not necessarily related to the content of the related RSS. Frequently, interviewees used peer consultation in order to gain insight into their colleagues' experience, particularly when evidence was either non-existent or unclear:

*And so often we don't know what to do with the interesting cases and so people will harken back to*

*their memory of what they did with "So and So" ten years ago that had a similar thing. I'm not big into experienced-based practice but sometimes that's what you do when you don't have a specific condition to... randomized trials to guide your therapy on. – P9*

*Aside from peer consultation, physicians described how CME events enabled networking with their colleagues about career or work-related matters as illustrated by this physician: "...it helps me figure out who I would like to collaborate with. What everybody's doing so I'm not reinventing the wheel." – P1*

*Local CME also gave physicians an opportunity to increase their social interactions with their colleagues: "...it gives you an opportunity to catch up with people, to see your colleagues either inside the hospital setting or outside at Journal Club, to socialize over food or a glass of wine whatever is there." – P7*

## 3. Outcomes from local continuing medical education

This theme included specific outcome measures that were the result of RSS which included the sub-themes: Personal Learning and Satisfaction, Quality Improvement and Physician Changes. When explicitly asked, most physicians suggested that satisfaction or attendance at local CME events would reflect a successful outcome. However, in speaking of CME in general, they suggested other important outcomes including maintaining or improving their own medical skills and quality assurance/improvement.

**3a. Personal learning and satisfaction:** Physicians had a number of expectations of CME when it came to their own personal learning and satisfaction. Some participants stated that local events made them aware of new topics in medicine while others were made aware of deficiencies in their knowledge. Others considered how it stimulated their own learning:

*...[M]aybe that would be the role of CME you know [to] challenge you, allow you to realize where your deficiencies are and then perhaps finding ways of supplementing or directing you to the right resources. As opposed to the belief that you can come along and go away replete with knowledge. – P2*

The majority of physicians felt that the most practical outcome of CME was to assess participant satisfaction. Surveys or attendance numbers were frequently mentioned as a surrogate for satisfaction. This participant makes this point:

*You could do attendance and I don't mean like keep, but just people who vote with their feet, just that there are people who don't go to Renal Research Rounds or Biopsy Rounds or Grand Rounds because they just do not find it helpful, so that tells us something right there. – P8*

When physicians described the outcomes of local CME/CPD they frequently mentioned keeping abreast on new developments in medicine or maintaining or improving their existing skills. This interviewee describes this:

*You know when the whole [Drug X] and [Drug Y] story came out, that obviously was a good CME for me because it was an area that I hadn't been reading about, and when we did that Journal Club you know I became informed as to what to do with those drugs, so that was something where I didn't necessarily go and seek it out myself. – P11*

*While some participants were able to describe a specific change that resulted directly from locally organized CME, some participants felt that a goal of locally developed CME should be self-determined changes in one's practice: "I think if we could evaluate maybe at the end of every one of these sessions to see what people thought and modify that way, and ask them things like does it change your practice or not?" – P7*

**3b. Quality improvement:** There were participants who felt that local CME should incorporate a quality improvement focus:

*There's Quality Improvement projects identifying a gap or variation, going back to CME and telling them we should do a CME in that area. But then there's, present the CME and you get consensus and you go and you change practice and you want to try to see if there's a change in care and outcomes. – P9*

**3c. Physician changes:** More than half of physicians were able to describe changes that occurred as a result of attending RSS. Some physicians described changes that were directly related to the content of RSS. One example of these changes is shown below:

*Ok so last year (nephrologist's talk)... gave a talk about what you do with immunosuppression once they're on dialysis and he divided patients into never going to be getting a transplant again or gonna be getting a transplant. So if they are going to be getting a transplant keep them [on] a low dose*

*immunosuppressant so they don't get sensitized. So I have been doing that on some of my dialysis patients who have failed transplants but are waiting on the next one. – P6*

Some physicians described changes that were prompted by RSS but the change was not as a direct result of the RSS. Three examples of these changes are shown below:

*I kind of decided that I really wanted to try and get a handle on things like C3 Glomerulonephritis and C3 Glomerulopathy and that motivation did come from a Biopsy Rounds. And then you know, started reading more about it, went to sessions at the (conference) and then I was reading more about it when I came back and it definitely has changed what I do. And that came from our CME; most of the learning that took place was on my own after it. But then my deficiency was identified at that CME. And that definitely has changed what I do. – P2*

*...it is a good opportunity to get together and often times the questions at the end are the best opportunity to find out what (nephrologist) been doing with his GN (glomerulonephritis) or he's using (drug name) now, what the hell are you using (drug name) for? Just to find out how different people are practicing. So that back and forth which sometimes there isn't enough questions but that's always the most effective part of Rounds the questions at the end. – P9*

This example, as shown previously, also demonstrates changes prompted by RSS:

*...I remember I was contemplating re-biopsying someone with proteinuria afterwards (after the rounds the participant talked to the speaker) and I asked him he said "well I've seen many patients like yours with low grade proteinuria and I tend to just follow them for longer" and it actually helped. It wasn't highly evidence based, but it reassured me that I didn't need to be more invasive than I was being at the time. So that's something where I went to a Continuing Medical Education kind of session and I feel like I gained something that I feel directly affected my practice that in the next couple of days or weeks. – P3*

#### 4. Barriers to participation

The reasons a nephrologist would be unwilling or unable to participate in RSS were identified. Despite wanting to attend local CME events, some interviewees described barriers that prevented them from participating. Three

barriers emerged which included family, timing, and pharmaceutical sponsorship. In Alberta, Canada the pharmaceutical industry is allowed to sponsor or host educational events through either monetary donation, arranging speakers or organizing individual events.

**4a. Family:** Physicians with young families expressed the competing interests of attending local CME versus spending time with their families: “Night is impossible and that’s just because of family.” – P6

**4b. Timing:** Timing was mentioned as a modifiable variable that might impede attendance at local events. Different aspects of timing emerged including preferences for specific times, a desire to have a regular repeating schedule and a need to keep time commitments static at their current levels:

*And then of course the fact that these things happen at regularly scheduled times actually means that you know you can go at that time. So you kind of put it aside for that. So that’s one of the biggest factors that I go, I think it’s cause you know it’s going to happen. And things that vary in time can become very hard to fit into the structure. – P3*

**4c. Pharmaceutical sponsorship:** Some participants expressed discomfort with pharmaceutical sponsorship in the current model of local CME events:

*I’m not sure we should be using pharmaceutical funding. Let me change that. We shouldn’t be using pharmaceutical funding to drive our CME. The problem is how do we get people to attend Journal club if you’re not doing a nice dinner out? – P9*

### Engagement

The four major themes were related through their effect on physician engagement. Each theme contributed in some way to physician engagement and also interacted with and were dependent on one another. For example, physicians were loath to participate in activities if they did not perceive RSS would be of quality, they would gain something for themselves and their practice and have an opportunity to meet colleagues. Collegial interaction depended on attendance and the stimuli others provide to verify the quality of the program and identify important outcomes. Those who did not attend regularly missed the opportunity to gain from and contribute to the education, the quality of the educational session and the collegial interactions.

## Discussion

Our study provides a unique examination of elements that affect physician engagement in RSS and self-reported changes resulting from RSS within a broader context than traditional outcome measures. By using a thematic analysis, we were able to identify four interrelated elements: *features that affect the quality of the RSS, collegial interactions, outcomes, and barriers to participation*. Our study was also able to identify self-reported changes that physicians make due to RSS, both directly and indirectly related. We believe that our research is important and novel because it adds support to the concepts proposed by Olson and colleagues.<sup>10</sup> In particular, we believe that our study adds to the knowledge about outcomes of RSS, collegial interactions, and barriers to RSS.

Physicians in our study described changes both directly related to RSS as well as changes prompted by, but not directly due to RSS. They also described unanticipated practice changes due to self-learning inspired by RSS, peer interactions during RSS and expert consultation facilitated by RSS. These findings give important support to the notion proposed by Olson et al.<sup>10</sup> that traditional studies of educational events may have missed important outcomes from these events and underestimated their true effect. These changes or outcomes from RSS may indirectly relate to the events themselves and may not necessarily be those that are intended by these organizers. We believe that future study in this area is warranted to define what is the nature of these types of unanticipated changes, what features of CME or RSS lead to unanticipated changes to physicians’ practices, and the prevalence of these types of changes resulting from RSS.

In our study, participants valued the collegial interactions fostered by RSS. In essence, the RSS facilitated the creation of a collegial network in which participants gained access to the knowledge and wisdom of colleagues through peer consultation. These interactions were not always related to the specific content of the event. The social interactions were also important in addressing issues that were not directly related to patient care but nevertheless served to strengthen the connection to the network. The relationships created allowed reciprocal benefit. Previous studies have demonstrated that physician interaction with colleagues is an important element of practice change,<sup>25</sup> and our study echoes these findings although our study is unique in that it may be a mechanism of action of CME/RSS resulting in change from educational interventions. When

physicians described changes to their practice, these informal interactions were frequently mentioned. This serves to remind us that while information transfer is frequently used as the main rationale and focus of RSS, informal interactions may be more important than previously thought. The results of our study also speak to the need for further research related to the mechanisms needed to maximize the social interaction of colleagues as a mechanism of improving the efficacy of CME/RSS.

Despite the benefits of engaging in RSS, physicians described barriers to participation. For some, timing, family commitments and pharmaceutical sponsorship created conflicts. In the longer term, these barriers may impact physicians' ability to gain new clinical knowledge and skill but also to form the collegial relationships that also contribute to the delivery of better patient care. There is evidence of a positive relationship between physician performance and participation in CME as well as the negative impact on performance when physicians are isolated and unable to develop collegial networks.<sup>26,27</sup> These barriers speak to some of the political and organizational issues that should be considered when planning RSS and are likely to have a significant effect of the efficacy of RSS resulting in practice changes.

Finally, our study adds to the limited qualitative literature in are of CME interventions. Physicians were cognizant that they and their patients gained from their participation in RSS. They noted the importance of having high quality presentations that incorporated evidence-based and clinically relevant content, enabled active participation, and facilitated input from experts. These expectations are well aligned with contemporary research that has found better outcomes occur when programs are interactive, use key opinion leaders and focus on clinical cases.<sup>28-30</sup> They identified not only personal satisfaction but also quality improvement as outcomes. They could describe specific RSS events that purportedly resulted in practice changes. This desire to have CPD result in practice change is supported by both adult learning theory and physician change research<sup>29,30</sup> which advocates for CME designs that have broad impacts on the physician, the patient, and the population. While it may be difficult to measure all the possible changes that result from RSS, organizers should explicitly consider outcomes measures during the planning stages.

This study has several implications for those in RSS leadership and in teaching roles. Organizers should aim to consider both the anticipated and unanticipated effects of

RSS and should be encouraged to try and define these types of changes. In addition, time should be taken to consider the social interactions that occur during RSS and ways to maximize this element of RSS. Equally important, is the need to identify barriers and consider mitigation to support the creation of a durable network. Lack of attendance has the potential to weaken the network thereby limiting the potential for the group to make changes individually and collectively to improve patient care. For example, if physicians with family responsibilities find it impossible to attend at a specific time, consideration might be given to changing the timing or providing electronic access to encourage participation. Given the role that the pharmaceutical industry has on prescribing practices,<sup>31-33</sup> further discussions to mitigate the potential for bias or identify other funding sources might address physician concerns. Finally, our data enforces the notion that the programming should be of high quality through well conceptualized planning, implementation, and evaluation of activities.<sup>34</sup>

There are limitations to the study. Our findings are limited to a study done in 15 nephrologists in one hospital, and as such the findings may not transfer well to other specialties or settings. Large scale quantitative studies will be needed to show how and to what extent these factors generalize to CME for more physicians in more specialties and practice settings.

## Conclusion

Our study suggests that specific features of RSS result in enhanced physician engagement and identifies elements that physicians identify as resulting in change in their practice. We support the notion that there are benefits to RSS that may not be adequately accounted for in the many CME outcome studies.<sup>12</sup> Our study suggests that medical educators should consider the elements that contribute to high quality RSS events and that also maximize the opportunities for physician interaction as these are likely to lead to both planned and unplanned changes.

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