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WEB PAPER

Resident run journal club: A model based on the adult learning theory

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Abstract

Background: Multiple formats of journal club exist but data is lacking regarding which model is most effective. Many residents are dissatisfied with their current format, which was the case at our institution.

Aim: This article discusses a resident run model, residents' perceptions following its implementation, and recommendations for running a successful journal club.

Methods: A resident run model of journal club was developed based on Adult Learning Theory. A 30-question survey was created to assess residents' attitudes and satisfaction with the new model.

Results: All respondents preferred the new model compared to the old model. Residents reported the new model increased their medical knowledge (88%) and they were able to apply the methods learned in journal club to actual patients (82%).

Conclusions: A resident run model of journal club may be a viable option for those attempting to start or improve their current club.

Background

Journal club is an accepted part of most Internal Medicine residency training programs in the United States and its history has been well documented. (Linzer 1987) Journal club has helped fulfill many different educational needs for programs over time. Currently, most journal clubs are organized to stay abreast of current medical literature as well as to meet requirements established by the Accreditation Council for Graduate Medical Education (ACGME) in teaching critical appraisal skills and evidenced based medicine (ACGME Outcome Project 2007).

The structure of journal club varies at each institution and several authors have reviewed the multitude of formats that exist (Sidorov 1995; Alguire 1998; Green 2000; Ebbert et al. 2001). Despite these studies there has been a paucity of medical literature about journal club over the past several years. Indeed, despite the acceptance of journal clubs in academic medicine, few papers describe which types or structures of journal club are most effective in accomplishing their goals.

As residency programs deal with work hour restrictions, it is imperative that all learning venues be evaluated to determine if they are meeting their goals. Research is needed to evaluate various models of journal club. Experientially, many programs with an active journal club still believe it needs improvement (Mehrabi & Cruz 2006). Some authors have called for moving beyond journal club because it does not meet the goals of their programs (Hatala et al. 2006). Clearly, there is room for improvement within the existing structure of journal club.

Practice points

- Journal club formats vary extensively without a clearly superior method.
- Defining goals is the first step to a successful journal club.
- Structured review instruments for articles enhance journal club.
- The presence of subspecialty staff may augment learning.
- Resident run models of journal club can be successfully implemented.

At our institution, journal club has long been a part of our academic curriculum. Five years ago, the residents were dissatisfied with the format and desired change. At that time, journal club was held once a month and focused on reviewing one article per session. The meeting was run by an appointed staff mentor (usually a general internist with specific training in epidemiology and clinical research) and the senior teaching resident (a resident on a rotation designed to improve their teaching skills). The article was selected by the resident with minimal guidelines and then typically distributed to attendees at the beginning of that journal club. The housestaff were then divided into four groups, who would each focus on the introduction, methods, results, and clinical implications, respectively. The majority of the discussion would focus on critical appraisal skills and biostatistics with little emphasis

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placed on clinical application of the article. The housestaff were dissatisfied and disinterested mainly because they felt the articles were not clinically relevant, the discussions on biostatistics tended to become too in-depth, and they felt more like bystanders than active participants in the meeting.

Given these feelings, a new journal club was created. After implementing the new model of journal club, a survey was conducted to determine its effectiveness. The results of that survey and suggestions based on existing literature for running an effective journal club are presented in this article.

Method/theory

The new model of journal club model was formulated on Adult Learning Theory (ALT) (Kaufman 2003). ALT emphasizes an effective learning environment where learners feel comfortable expressing themselves. Learners will be more involved when they can take part in planning the activity and selecting the curricular content. By allowing residents to be in charge, it affords them the opportunity to identify their own learning goals and objectives. One of the main goals was to allow residents to run the meetings, while still having the support, availability and expertise of faculty mentors when needed.

Journal club committee

The first step in the process was to form a journal club committee (JCC). This committee consisted of residents from each postgraduate year group and a faculty mentor who participated in defining the goals of journal club, selecting the articles, and running journal club meetings. It is important to note that setting goals for journal club cannot be overlooked. Through the history of journal clubs, the most common goals established for journal club are to keep current with the literature, teach critical appraisal, and review articles that impact clinical practice (Linzer 1987; Alguire 1998; Mehrabi & Cruz 2006). Our new journal club model was based on a predefined set of goals, which are shown in Table 1.

The JCC created a yearly schedule with a different internal medicine subspecialty to be highlighted each month. The JCC then met monthly to plan the next month's meeting and select the articles that would be discussed (Figure 1). The articles were chosen by the JCC reviewing current literature as well as getting input from subspecialists in the respective field. One of these articles was to be an important study from the most recent literature, while the second article was to be a landmark study. For example, during the cardiology month the landmark study was the HOPE Trial and the cutting edge article was a meta-analysis on statins for acute coronary syndrome published in 2006 (Yusuf et al. 2000; Hulten et al. 2006). We felt this would allow residents to not only stay abreast of the latest literature but also gain a firmer understanding of the literature that provided the foundation for many of our current practice standards. One junior and one senior resident on outpatient rotations or electives would be responsible for presenting the articles. The articles were emailed to the residency program on two separate occasions prior to the meeting. Additionally, journal articles were available at morning report early in the month for distribution.

Table 1. Goals of new journal club format.

Resident run with staff supervision
Review current and landmark articles
Practice or apply critical appraisal skills learned in other venues
Increase biostatistics knowledge
Improve resident participation and attendance
Focus on clinical meaning of articles
Create reference library of reviewed articles

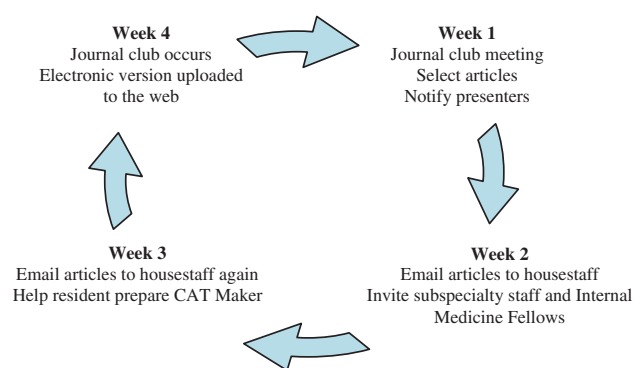


Figure 1. Timeline for journal club.

Journal club format

Journal club would take place once a month for 45 min over lunch. During the meeting, two articles would be presented with each being allotted approximately 20 min. The presenters used 'Critical Appraisal Tool' (CAT) software to help residents streamline their presentations leaving the majority of journal club time for discussion. Journal club members were encouraged to read the articles and help spur discussion and facilitate questions during the presentation. Subspecialists and/or general medicine staff were invited to provide clinical input and appraise the articles. The moderator served to ensure that no one staff or resident dominated the discussion. Following the meeting, a summary of the articles discussed was placed on our journal club website for future reference.

CAT maker software

The CAT maker software (Oxford Centre for Evidenced-Based Medicine) was developed based on the McMaster Criteria to allow a fast, simple and organized approach to reviewing and presenting articles (Center for Evidence Based Medicine 2007). The software enabled us to streamline resident presentations on a variety of articles. CAT maker software could be tailored for most types of articles such as therapy articles, diagnostic articles, prognostic articles and systematic reviews. CAT maker software is available on the internet for no cost as shareware (Center for Evidence Based Medicine 2007).

Journal club survey

A 30-question survey was created to assess residents' attitudes and satisfaction with the new journal club (Appendix 1). The survey was created specifically to evaluate a number of new interventions that were implemented with the new journal club format. Likert-scale questions were used to assess the

resident-run facet of journal club, the quality of articles being selected, the usefulness of having sub-specialty staff at these meetings, the effectiveness of emailing PDF of articles to our residents, the ease of using CAT maker software and finally having the journal club focus on resident and staff discussion of a particular article. We also assessed residents' overall impression of the new journal club, its impact on medical education, and how it compared to the previous journal club. The survey was distributed by email and hard copy. Questionnaires were collected anonymously by the program administrator and names were removed prior to giving them to the study team. All residents in our program received this survey nine months after the implementation of our new journal club. We excluded residents directly involved with the design of our new journal club to prevent possible bias.

For analysis purposes, we grouped Likert scale responses into three groups: less than or equal to 2 would mean resident disagreed with the statement, three on the Likert scale indicated a neutral opinion on the statement, and greater than four on Likert scale indicated agreement with the statement. Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS).

Results

The survey was completed by 28/32 (87.5%) eligible internal medicine residents. There was no difference in responses based on resident training year (PGY-1 *vs.* PGY-3). The optimal characteristics of journal club were that it occurred at noon, occurred once a month, lasted an hour, and reviewed

two articles at each session. The overall survey results are displayed in Table 2. Respondents unanimously (100%) preferred the new format to the previous version. All respondents felt more motivated to attend and participate in the resident run journal club.

Eighty-eight percent of responding residents felt journal club increased their medical knowledge and 85% reported the articles discussed during journal club were applicable to their patients. Eighty-two percent responded that they used techniques learned in journal club when reviewing articles on their own.

Ninety-two percent of respondents felt having a subspecialty staff at journal club enhanced learning. Eighty-nine percent of residents reported that emailing articles prior to journal club facilitated learning. Only 39% of residents found the 'CAT' maker useful.

Discussion

Journal club is an academic forum designed to educate residents about critical appraisal, the importance of keeping up-to-date with literature and the practicality of applying study results to patients. Getting residents to buy into this process is important and often challenging. Unfortunately, many residencies place little emphasis on journal club and this process. The model for journal club developed at our institution was both well received by residents and appeared to meet several of the goals outlined earlier.

We believe that one of the reasons for the success of our model was that it employed key principles of the Adult

Table 2. Residents' response to survey.

Question	Likert score ^a	Percent <2 ^b	Percent >4 ^c
Main reason I come to journal club is the food	2.4(1.2)	48	17
Journal club should have more staff involvement	3(0.9)	21	25
Journal club has increased my medical knowledge	4.3(0.7)	0	88
I apply the articles discussed to my patients	4.2(0.7)	0	85
I find the CAT maker a useful format for reviewing articles	3.2(1.1)	25	39
I use the online journal club to answer clinical questions	2.2(1.1)	64	11
I use techniques used in journal club when reviewing articles on my own	3.8(0.9)	11	82
I like the articles that have been chosen for journal club	4.4(0.7)	4	96
I go to journal club because I enjoy the social atmosphere	3.8(0.9)	28	71
Going to journal club has increased my understanding of biostatistics	3.8(1.1)	7	63
Attending journal club has motivated me to read more primary literature	3.8(0.9)	7	61
Receiving articles by email makes me more likely to read them prior to journal club	4.5(0.8)	4	89
I read the journal club articles prior to the meeting	3.4(1.2)	21	57
I get more out of journal club when I read the articles prior to the meeting	4.5(0.5)	0	100
Journal club changes the way I manage patients	3.8(0.7)	4	71
Journal club helps me to feel up to date with the important literature	4.3(0.6)	0	93
Journal club has increased my confidence when evaluating medical literature	3.8(0.8)	4	79
Journal club is a good use of my time	4.2(0.7)	0	89
Journal club has increased my sense of independence as a physician	3.7(0.9)	7	63
Topic specific staff available at journal club enhances learning	4.4(0.6)	0	92
The new journal club format is better than the previous	4.8(0.4)	0	100
I am more involved in the journal club with the new format	4.5(0.5)	0	100
Resident run journal club picks more relevant topics	4.3(0.5)	0	100
Using the CAT-maker makes critical appraisal easier	3.5(0.9)	20	53
I like using the CAT-maker	3.1(1.2)	20	33
I am more likely to attend the new format of journal club	4.5(0.5)	0	100

Note: ^aMean (Standard deviation).

^bResident disagreed.

^cResident agreed.

Learning Theory. There have been previous papers that describe the use of ALT concepts in structuring journal clubs (Alguire 1998; Inui 1981; Seelig 1991). Inui (1981) reported on a model that used recent patient experiences as the origin for selecting articles. An article would be chosen based on a current patient and then presented to the group. A resident would discuss the article and its application to the patient. A staff facilitator would then lead a discussion on whether the study was appropriately applied.

Seelig (1991) implemented a one-time intervention on ALT into journal club and studied its effect. They held a 1 h session that focused on the importance of journal club. They discussed the growing size of medical literature that exists and the reasons why physicians read medical literature. Journal club was established to be the venue where residents could learn about current literature, develop critical reading skills, and learn basic decision making and biostatistic skills. The goal was to establish a journal club that illustrated practical skills residents could use throughout their careers. They used self-evaluation and active learner participation in discussing sample journal articles designed to teach certain points. Reading assignments were also given to test the learned skills following each meeting. The articles would then be discussed at the next meeting. Seelig (1991) concluded that the model improved the reading habits of residents.

Adult Learning Theory is directed towards creating self-directed learners. Recently, several papers have called for an increased focus on teaching self-directed learning (Green & Ellis 1997; Hartzell 2007). This is an empowering process for the learner and gives residents personal responsibility for their own education. More importantly, it teaches them a set of skills that they will be able to use throughout their career after residency. Identifying specific models to practice these skills is essential if programs expect graduating residents to be confident and successful in using them after their training is completed. In our survey, residents reported using the skills learned in journal club when caring for patients on their own. They also reported having increased confidence in evaluating the medical literature and an improved sense of independence as a physician. These points highlight the potential effectiveness of this model.

A number of other positive aspects were identified by our survey. First, we found that having subspecialty staff attend our meetings provided clinical perspective on journal articles that is unobtainable by simply reading and appraising articles. Subspecialty staff attended conference each month when their respective subspecialty was being presented. This allowed residents to see how senior faculty approach and use the literature. Unique to the process was that with rotating topics, residents had the opportunity to observe different senior staff demonstrating these skills. The importance of this point cannot be overemphasized, as young housestaff are likely to model these behaviors in their own practices.

The attendance of general internal medicine fellows at the conference gave us an expert in the audience able to teach residents critical appraisal skills and answer questions regarding biostatistics. While the focus of our model was the clinical relevance of and how to apply the literature, having an expert in biostatistics present provided additional educational value to the meetings. Not all programs may have associated

fellowships, but this role could be filled by anyone familiar with and comfortable in teaching biostatistics.

In our experience, emailing electronic copies of the articles to residents increased participation. It may have also been the emphasis on clinical relevance that increased resident participation and preparation for discussion. Journal clubs often focus their sessions on either current literature or landmark studies, but to our knowledge we are the first to include discussions of both during a single meeting. We believe choosing both a recent and an older article on the same specialty affords a welcome contrast to the meeting and discussions. Residents also gain a broader understanding of the basic principles rather than simply looking for the newest findings.

The CAT maker software seemed to streamline our presentations. It allowed articles to be discussed in about 10 min in an organized fashion permitting sufficient time for discussion and more learner participation. Despite the software's ability to streamline to presentations, it was not well received by the residents. Only 39% of the residents found it useful although based on resident feedback we believe this was secondary to lack of familiarity with the software, which can be difficult for the first time user. After residents became comfortable with the software, they found it an effective way to present the article. We would recommend that any program planning on using the CAT maker software have designated people available to instruct first time users to prevent the initial growing pains of using the software.

Most journal clubs follow some basic format when presenting, and we believe this is very important. When left to residents' discretion there is too much variation in the presentations and it can detract from the more important points of the session. Other journal clubs have reported using structured review instruments with success (Burstein et al. 1996). An emergency medicine program adopted a structured review instrument to be used prior to and during meetings and residents reported improved satisfaction with the meeting and perceived educational value. A recent article described a format for presenting articles in 10 min (Schwartz et al. 2007). The McMaster's Criteria provide a framework for discussing most types of articles and are a useful adjunct for organizing presentations (Guyatt & Rennie 2002). The specific format used is probably not as important as merely having a reliable efficient system in place for residents to present articles.

There are a number of limitations to our study. The model was only studied at one institution and only by a small number of residents. In addition, we were not able to establish the impact of the journal club on hard outcomes such as resident knowledge, in-service exams scores or patient care outcomes. However, our survey suggests that we may be reaching some of these goals. Almost all residents felt journal club increased their medical knowledge (88%) and residents were applying techniques used during meetings to subsequently care for patients (82%). The fact that residents believed they were learning and were using the techniques in real practice provides evidence of the effectiveness of the model.

One of the primary outcomes measured by our journal club was satisfaction. Yet, satisfaction has been used in the past to measure the success of journal clubs and satisfied residents are more likely to participate and learn from the experience

(Alguire 1998). Other studies have looked at longevity greater than 2 years and attendance as a markers of success in journal club (Sidorov 1995). While we do not take attendance, journal club is always well attended compared to other lecture-based conferences. It currently ranks second to morning report among all of our academic conferences (ranked yearly at WRAMC by residents) further suggesting its success. The previous model of journal club was ranked last. The current model has been maintained at our institution for over 5 years. Measuring the value of academic programs can be difficult, but we believe we have enough evidence that point towards this model of journal club being an effective educational activity.

Conclusion

Journal club remains an integral part of residency training, but a paucity of data exists to determine which are the most effective. We described a resident run model based on the principles of Adult Learning Theory that improved resident satisfaction and perceived educational value. While future studies should be done examining more defined outcomes, the current data suggests this model could be used effectively in other programs.

Disclaimer: The views expressed are those of the authors and should not be construed to represent the positions of Walter Reed Army Medical Center, the Department of the Army, or the Department of Defense.

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Appendix A: Journal Club Survey

You have been chosen to complete this questionnaire because you are an Internal Medicine Resident at Walter Reed Army Medical Center who participates in Journal Club. The questionnaire is part of a research project entitled: **Resident Run Journal Club: An exciting new approach to resident education.** The project is designed to measure residents' *subjective assessment* of the effect of the new format of journal club on resident education and its overall usefulness. The Principle Investigator for this study is Josh Hartzell, MD.

Your participation in this study is entirely voluntary; should you decide to participate your responses will remain completely anonymous to the researchers. The survey will be

returned to a third party (Department Secretary) not involved with the project who will eliminate any personal identifiers prior to giving the survey back to the researchers. The survey should take approximately 10 minutes to complete. You will not benefit directly by completing this questionnaire, but the information we learn from this study may help us with future journal club development. Your decision to participate or not participate in the survey will not affect your medical career or rating in any way.

Completion and submission of the survey will constitute your consent to participate in this research study. Please complete the survey only once.

Thank you for your participation.

Resident Run Journal Club Questionnaire

PGY1 PGY2 PGY3

Instructions: The following is a questionnaire about resident run journal club. All questions should be answered using the scales below.

	Strongly Disagree		Neutral		Strongly Agree
1. The main reason I come to journal club is because of the food.	1	2	3	4	5
2. Journal club should have more staff involvement	1	2	3	4	5
3. Journal club has increased my medical knowledge	1	2	3	4	5
4. I apply the articles discussed to the care of my patients	1	2	3	4	5
5. I find the CAT maker a useful format for reviewing articles	1	2	3	4	5
6. I use the online journal club to answer clinical questions	1	2	3	4	5
7. I use techniques I learned from journal club when reviewing articles on my own.	1	2	3	4	5
8. I like the articles that have been chosen for journal club.	1	2	3	4	5
9. I go to journal club because I enjoy the social atmosphere.	1	2	3	4	5
10. Going to journal club has increased my understanding of biostatistics.	1	2	3	4	5
11. Attending journal club has motivated me to read more primary literature	1	2	3	4	5
12. Receiving articles by email facilitates me reading them prior to journal club.	1	2	3	4	5
13. I read journal club articles prior to attending the meeting.	1	2	3	4	5
14. I get more out of journal club when I read the articles prior to the meeting.	1	2	3	4	5
15. Journal club changes the way I manage patients.	1	2	3	4	5
16. Journal Club helps me to feel up to date with the important literature.	1	2	3	4	5
17. Journal club has increased my confidence when evaluating the medical literature.	1	2	3	4	5
18. Journal club is a good use of my time.	1	2	3	4	5
19. Journal club has increased my sense of independence as a physician.	1	2	3	4	5
20. Having topic specific staff available at journal club enhances learning.	1	2	3	4	5
21. The best time for journal club is . . .	Noon conference				Afternoon
22. What do you feel is the optimal number of articles to review during a one-hour journal club meeting?	1	2	3	4	
23. How often do you think journal club should be held?	Weekly		Twice/month		Monthly
24. What is the optimal duration for journal club?					
PGY-2 AND PGY-3 ONLY					
25. The new journal club format is better than the previous	1	2	3	4	5
26. I am more involved in journal club with the new format	1	2	3	4	5
27. Resident run journal club picks more relevant topics	1	2	3	4	5
28. Using the CAT-maker makes critical appraisal easier	1	2	3	4	5
29. I like using the CAT-maker.	1	2	3	4	5
30. I am more likely to attend the resident run journal club.	1	2	3	4	5
Do you have any suggestions for improving Journal Club?					