



## Development of a Workshop on “Optimizing Learning in Orthopaedic Surgery”

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### Abstract

**Objective:** The objective of this study was to conduct needs assessment, develop and evaluate a workshop template pertaining to the “optimizing learning during orthopaedic residency training”.

**Methods:** A needs assessment with a composite group of residents was completed. Based on the needs assessment specific objectives to be completed by the end of an interactive workshop were identified. Worksheets from each group session were collected from the participants to create a summary of discussion sessions. We used thematic analysis to analyze the discussion session. A standard evaluation tool was used to evaluate the workshop.

**Setting:** The largest accredited academic institution for orthopaedic surgery within North America.

**Participants:** All PGY1 through to PGY4 residents were invited to participate in the workshop and its evaluation. A total of 44 residents participated in the workshop discussions and 39 residents evaluated the workshop.

**Results:** A workshop was developed based on the needs assessment. Schedule was outlined consisting of small group discussions followed by a plenary session after each main domain. Summary of discussion sessions was the main deliverable from this interactive orthopaedic resident workshop. Three main themes emerged from the summary of discussion sessions to be of critical importance to optimize learning during orthopaedic residency: 1) residents’ interaction with other residents and health care providers, 2) resources available to residents clinically and academically and, 3) time management including clinical, academic and life management skills.

**Conclusions:** The summary of discussion sessions is an important document that may assist residents, even those who did not attend the workshop, to optimize learning during orthopaedic residency. Future studies need to evaluate the impact of the workshop on “optimizing learning during an orthopaedic residency training”.

**Keywords:** Orthopaedic surgery; Workshop development; Residency training

### Introduction

The goal of each orthopaedic residency program is to educate a competent orthopaedic surgeon to meet the musculoskeletal health care needs of society. There is a paucity of literature on how residents optimize learning during their training [1]. Gofton and Regehr reported in their literature review that one key factor in optimizing the learning environment for orthopaedic residents is to “maximize training efficiency by maintaining the optimal challenge point for each individual learner” [2]. This paper reports on a recently-completed study involving the development of an interactive workshop on how to “optimize learning in orthopaedic surgery” and to enhance a resident’s ability to achieve Royal College of Physicians and Surgeons of Canada Orthopaedic certification.

The objective of this study was to develop and evaluate a workshop template pertaining to “optimizing learning during an orthopaedic residency training” and, as a result, to develop a summary of discussion sessions on successful strategies to improve knowledge and skill acquisition for orthopaedic residents during their training.

### Methods

This observational study involved orthopaedic surgical residents from the largest accredited academic institution within North America. A needs assessment with residents from various years was completed. Based on the needs assessment, specific objectives to be met by the end of an interactive workshop were identified.

The 48 residents from each of the PGY1 through to PGY4 years

were invited to attend a workshop and were pre-assigned into small groups based on random assignment of the resident list by years (see Appendix A for an agenda of the workshop). The PGY5 residents were excluded due to examination conflicts. Worksheets from each group session were collected from the participants to create a summary of discussion sessions. Two researchers used thematic analysis to analyze the discussion sessions (which were in qualitative form). This summary was then reviewed by a group of residents and the program director to ensure that it reflected the discussions.

Upon completion of the workshop, the residents were requested to evaluate it. A standard evaluation tool that included qualitative and quantitative questions was used to evaluate the workshop. Data from the evaluation were analyzed using descriptive statistics.

### Results

#### Needs assessment

A composite of eight residents (two from each year) have completed

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a needs assessment. Residents identified three major domains to be of critical importance to their ability to learn during residency. These included:

1. What makes learning orthopaedic surgery unique/how to prepare for specific rotations?
2. How to create a "good" learning environment and to "make learning stick"?
3. Identify the milestones and optimize preparation to successfully "challenge" these milestones during residency.
  - a. How to demonstrate and communicate "competency" on a day to day basis?
  - b. When to start thinking about fellowship educational experiences?

### **Workshop development, summary of discussions and evaluation**

A total of 44 out of 48 potential residents participated in this workshop for an overall response rate of 92%. Two of the successful PGY5 residents participated as a plenary session facilitators. A 24-page evaluation document was the main deliverable from this interactive orthopaedic resident workshop. This document directly correlates with the discussions based on the workshop agenda and outlined the ideas shared in the three sessions.

The first small group session pertained to "how to prepare for a specific rotation" (Appendix B). During this session it was emphasized that residents were required to read around the content specific to each of the orthopaedic domains. A reading list based on review articles, journals and core textbooks was generated. In addition, it was emphasized that residents needed to prepare in advance for each potential clinical encounter experienced in either the outpatient clinics, operating theatre and during their "on call" clinical duties. Finally, it was identified to be critically important to optimize and organize their time for each of these educational opportunities to potentially maximize their learning.

The second small group session pertained to identifying the learning opportunities and how to "make learning stick" (Appendix C). Residents became aware of the power of taking their own initiative to generate positive learning experiences. Specifically, it was important for the residents to first define all of the possible clinical learning opportunities. Second, it was important for each resident to create a "supportive and intellectual" educational environment. Third, it was emphasized that residents needed to define specific behaviours that may either enhance or take away from a clinical learning opportunity. Finally, it was important for residents to understand what they needed to do prior to any given learning opportunity to really facilitate making what they learned "stick". Strategies on how to retain new information was discussed.

The third small group session pertained to identifying the milestones and how to optimize preparation to successfully "challenge" these milestones during residency (Appendix D). Specifically, it was important to identify strategies by which the junior residents prepared concurrently for their rate-limiting examinations such as the Medical Council of Canada Qualification Examination-Part II (MCCQEII) and The Principles of Surgery (POS) Examinations. It was emphasized that residents who were successful tended to work with other residents from different disciplines than orthopaedic surgery and completed old examination questions from circulating examination banks in small

groups and then reviewed both on an individual and group format.

With regard to the senior residents, the focus on milestone preparation was around the following examinations: the orthopaedic in-training evaluation (OITE) and; the Royal College of Physicians and Surgeons Canada (RCPSC) Orthopaedic Fellowship examination. It was emphasized that residents should optimize their learning by working together in study groups, to complete old examination questions both circulating and on-line resources and make every effort to create examination questions based on current case presentations and review within small groups and then facilitate retention by repeat review both individually and in small group format. Finally, determining the location for fellowship training in sub-specialty areas was discussed. It appeared that residents should first complete rate-limiting examinations prior to even considering their fellowship opportunities. Then, it was deemed important to determine their area of interest and intent on pursuing an academic or non-university based clinical practice. Each of these pathways will determine which fellowship opportunities would be most appropriate for any given resident. The location of various fellowships may be determined by seeking out the location of either academic or clinical surgeons with specialty interests in any of the orthopaedic sub-specialty domains. Adequate time to apply and interview for such fellowship positions needs to be considered and sought within a timely fashion during one's residency.

The workshop was evaluated by all participating residents upon its completion. A total of 39 residents completed an evaluation of the workshop. Eight PGY1s, 12 PGY2s, 7 PGY3s, 11 PGY4s and one resident did not identify their level of training. Overall, 33/39 (85%) residents were either satisfied or very satisfied with the workshop. At least 24/39 (61%) of residents felt more confident in their abilities to organize their time better, as a result of attending the workshop and 23/39 (59%) felt more confident in their abilities to create a good learning environment as a result of attending the workshop.

Residents who attended the workshop were then invited to complete a follow-up survey three months later. Thirty-four residents completed the survey. Resident confidence in their abilities to organize their time better dropped to 13/34 (38%) from 61% over the three month period. Eighteen of thirty-four (53%) felt more confident in their abilities to create a good learning environment as a result of attending the workshop compared to 59% immediately after the workshop.

Residents indicated they appreciated the discussions during the workshop, especially the junior residents who exclaimed they received valuable advice from their more senior colleagues. Everyone was appreciative of the summary that was created out of the group discussions. An evaluation feedback summary of some specific aspects of the workshop is listed in Table 1 and 2.

Regarding the residents' suggestions for improving the workshop, some thought the workshop could have been shorter. However, others thought it was too rushed and could have spent longer discussing the topics. Some also felt that some of the topics were repetitive.

Most importantly residents cited numerous examples of strategies they planned to implement as a result of the workshop discussions. These strategies included ideas for time management, studying with others, and beginning studying for examinations earlier. Many of these strategies are listed in the evaluation report. Furthermore, residents were asked on the three month post-workshop survey to indicate three things they were doing differently to optimize their learning as a result of attending the workshop. The most popular responses included, obtaining better resources earlier for various examinations, organizing

What Residents liked best about the workshop
Collaboration and discussion among colleagues in a small group format
Studying "tips" from the recent FRCSC Fellows
Time with the other residents to discuss these issues
Learning about the various resources available for specific high-yield reading
Interactive session
Learning from the experience of others
Input and advice from the senior residents
Receiving information about learning strategies especially pertaining to reading materials
Clarification of issues not apparent while doing residency
Receiving information pertaining to resources (websites, textbooks) that will be useful for each rotation while receiving information from the experience of the senior residents
A rare opportunity to discuss residency survival tips with senior residents
Receiving tips from other residents

**Table 1:** Summary of Feedback from the Residents Who Were Satisfied with the Workshop

What Residents liked best about the workshop
There was participation across all levels (R1 to R5s)
Workshop was punctual with objectives
Identification of resources for each rotation
Workshop was in a small group format
Hearing the experiences of the senior residents
Exposure to different views and approaches to learning
Discussion with the PGY5 residents (recent RCPSC Fellows)
It motivated resident to start studying hard

**Table 2:** Summary of Feedback from the Residents Who Were Neutral or Dissatisfied with the Workshop

small group study sessions, better time management, and increased discussion among fellow residents.

## Discussion

By the end of the workshop participants were able to acquire a better understanding of how to create a better learning environment by preparing for specific rotations and to prepare for the challenges of exam preparation during residency. Interestingly, comments provided by satisfied and somewhat dissatisfied residents are both complimentary and positive with respect to how they might better navigate themselves through residency. Even those participants who perceived to be somewhat dissatisfied during the workshop actually made comments that would be constructive to their residency training.

Overall satisfaction with learning from the workshop; ability to organize time management; ability to create a good learning environment and; ability to determine a mode of learning seemed to be high among most residents. This would suggest that the residents' skill set for optimizing their learning was modified after attending the workshop. Method of preparedness seems to be one of the key features emphasized in all responses. For example, preparing for all clinical encounters and evaluations is a learned behavior. What residents choose to reference prior to an educational activity may be individual to each resident. However, the act of doing so may significantly impact preparedness for their education. Method of preparedness has been evident in other studies [3-6].

The importance for residents to interact with each other throughout their training process should be emphasized. This would include interactions at levels both above and below a resident's current level of

training. Interactions among various levels of training, may demonstrate both the ability to educate others while reinforcing competency for those facilitating the teaching-learning process. The learners may then be better positioned to use new information to inform and educate less experienced residents.

The importance of interacting with peers and residents from other disciplines in activities such as collaborative learning was also highlighted to be important for optimizing learning during residency [7]. How residents interact with other health care providers, patients and industry may significantly impact their learning in a more informal manner.

A final concept to be addressed in residency education is the ability for residents to be self-assessors, which is not a skill set that comes naturally to most if any at all. Residents are typically just trying to survive the educational process. The ability to self-assess during residency would be important not only for patient safety and health but also for successfully understanding deficient areas in the curriculum for any given resident. If residents were able to successfully determine areas of deficiency, then strategies could be self-initiated to overcome weaknesses in these areas of training. The problem is how do we effectively teach self-assessment? This has yet to be studied.

To our knowledge no other residency program has developed such a template for optimizing learning. Some research has been done in undergraduate medicine and other medical specialties to optimize learning. Roberts, Newman, and Schwartzstein for example, provided *Medical Teacher* with 12 tips for understanding and engaging millennial learners and enhancing their learning [8].

## Conclusions

A template for optimizing learning in orthopaedic surgery was created and a summary of the discussion sessions was created as a result. The purpose of creating such a document was to provide residents with information to which they may refer when approaching specific aspects of residency education to optimize their learning experiences. Exploring strategies to optimize learning may be useful to enhance learning acquired during any potential educational opportunity. Future studies need to evaluate an impact of this workshop on changing behavior and improved academic performance in orthopaedic surgery.

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