

Designing an Optimally Educational Anesthesia Clerkship for Medical Students – Survey Results of a New Curriculum

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Original Article

Abstract

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Background: The field of anesthesia continues to be poorly understood and underestimated as a career choice for graduating medical students. The anesthesia clerkship is an important educational experience in which students learn a wealth of medical knowledge. Our aim was to develop an anesthesia clerkship which exposed the students to many aspects of anesthesiology in a well structured supervised environment. Based on this, we hoped that a positive learning experience would attract medical students to choose anesthesiology as a career.

Methods: We structured a four week anesthesia clerkship for third and fourth year medical students, which comprised of time in operating room, intensive care unit, pain and perioperative environments. The students completed a survey anonymously at the conclusion of their clerkship. We gathered 25 medical students' opinion of their newly revised 4 week anesthesia clerkship and analyzed their comments in the hope of creating an optimal educational experience for future students.

Results: Students reported an overall satisfaction with the new curriculum. Ninety-six percent of students stated that the clerkship increased their desire to pursue a career in anesthesia.

Conclusion: The response to our survey showed that a structured educational four week anesthesia clerkship was highly satisfactory and increased medical students desire to pursue a career in anesthesia.

Key Words – education, medical; student, medical; anesthesiology, career

Introduction

The anesthesia clerkship is an important educational experience that is often overlooked during medical school; however, it is an opportunity for students to learn a wealth of medical knowledge, procedural skills and to get a feel of what a career in anesthesiology involves. Many think that the anesthesia rotation is only for those who have an interest in a career in anesthesia; however, it is an opportunity to learn knowledge and skills that one can take with them to whichever field of medicine they choose to follow. When a medical student is assigned to a clerkship in the operating room, often they are left to their own devices without having a structured educational process. Their rotation may go well if they find a mentor willing to educate them. However, their time may be wasted if they are left as an often-ignored observer. Thus, depending on the students own assertiveness and self motivation, and on the institute's attitude and policy towards visiting students, the anesthesia rotation may be thoroughly educational or futile. Although self motivation is important, having a structured schedule with assigned teachers can impact the educational worth of a clinical clerkship. This paper reports the results of a survey distributed to medical students having completed a four week anesthesia clerkship. Numerical results and written comments regarding their opinion of their learning experience are reported.

Our aim was to develop an anesthesia clerkship which exposed the students to many aspects of anesthesiology in a well structured supervised environment. We hoped that the students would gain a basic understanding of anesthesia, develop some procedural skills and improve their knowledge of general medicine. Secondly, we hoped that a positive learning experience would attract medical students to choose anesthesiology as a career. Beginning with the 2008-2009 academic year, we designed a comprehensive structured four week curriculum for third and fourth year medical students in United States (U.S) medical schools. Students spent time in the operating room, intensive care unit, preoperative evaluation clinic, pain management service, post operative care unit and regional anesthesia service. Upon completion of the clerkship, the medical students participated in an anonymous survey from which we derived our data. We gathered 25 medical students' opinion of their newly revised anesthesia clerkship and analyzed their comments. Students reported an overall satisfaction with the new curriculum. We wished to establish students' attitudes towards their learning experience and to determine the benefits or difficulties they perceived from their experience. With this information, we hoped to continue to improve our anesthesia clinical clerkship and make it a more satisfactory experience for future medical students.

Method

The Institutional Ethics Committee approved the study. We designed a four week long anesthesia rotation, intended to give students a broad overall view of anesthesia. Students were assigned to the following:

- 10 days of general adult anesthesia
- 3 days of acute pain management service
- 2 days of regional anesthesia and peripheral nerve block placement
- 2 days in Post Anesthesia Care Unit (PACU)
- 2 days in Surgical Intensive Care Unit (SICU)

- 1 day in preanesthesia clearance and evaluation clinic (PACE clinic)

A total of 25 medical students completed the four week anesthesia clerkship during the year of 2008. On the first day of the rotation, the students were given a thorough orientation of the operating facility, a syllabus containing an outline of the rotation, a timetable of daily activities, a paper survey to complete upon finishing their rotation and an anesthesia manual to read. They were assigned a resident to supervise them each day during their time with us. They also received didactic lectures on basic airway management and were allowed to practice techniques on a mannequin prior to being sent to the operating rooms.

During their time in the operating room, students were assigned to a specific senior resident who supervised the student in conjunction with a staff anesthesiologist. They were encouraged to participate in all portions of anesthetic care, preoperative assessment, intraoperative patient management, procedures and postoperative patient follow up. Whilst on the acute pain management service, they assisted with the placement of epidurals and attended postoperative ward rounds on patients who had peripheral nerve blocks and epidurals inserted for post operative pain management. On the regional anesthesia service, they assisted with and placed peripheral nerve blocks. In PACU, they operated as part of the resident run PACU team, aiding with the management of postoperative issues. In SICU, they were assigned two patients to manage. They participated in ward rounds, lectures and procedures. Their day in the preoperative anesthesia clinic was designed to educate the student in the process of preoperative workup of a patient. During their time with us, students were encouraged to attend resident orientated lectures and grand rounds. They also participated in problem based learning classes.

Every student was given a list of goals to accomplish during each of their service rotations. Once the goals were completed, it was signed by either the staff physician or resident they worked with. This guaranteed that the student had been exposed to a broad range of anesthesia activities and ensured that they learned basic life support skills such as bag mask ventilation and cardiopulmonary resuscitation. At the end of their rotation, the students met individually with us and an exit interview was conducted. They gave their feedback and had their assignments checked. The students were given a paper survey on the first day of their orientation. The students were asked to complete the anonymous paper survey on the last day of their rotation and to place it in a designated mailbox. All students attending completed the survey.

Survey

The survey was designed to assess the students' expectations of the anesthesia clerkship and their opinion of the rotation, having completed it. Firstly, the student was asked to list their expectation of their four week clerkship. They were then asked to suggest what could have been done to improve the rotation and make it more worthwhile. Students expressed their opinion of their clerkship on a five point Likert scale, 1 being strongly disagree and 5 being strongly agree. The statements were as follows:

1. My expectations for this rotation were met.
2. My expectations for this rotation were exceeded.
3. This rotation has increased my desire to pursue a career in anesthesiology.

4. This rotation has helped improve my skills that relate to all areas of medicine (airway skills, intravenous line placement, etc.).
5. This rotation has helped improve my knowledge of anesthesia.
6. This rotation has helped improve my knowledge of general medicine.

The surveys were all assessed at the end of the year and the data was reviewed.

Results

1. Expectations

Many of the students had the same expectations of their anesthesia rotation and consisted of the following:

- Learn anesthesia fundamentals and clinical reasoning specific to anesthesia.
- Experience a number of anesthesia subspecialties, get a broad picture of anesthesia and see a wide variety of cases.
- Be actively involved in patient care.
- Receive intraoperative teaching and attend anesthesia lectures and conferences.
- Assess anesthesia as a career option.
- Get a feel for our anesthesia residency program.
- Learn airway management and other clinical procedures such as intravenous access, arterial lines etc.
- Learn perioperative care.
- Learn the pharmacology of anesthesia drugs.

2. Response to statements

The students were asked to respond to a number of statements and give their opinion on a five point Likert scale, 1 being strongly disagree and 5 being strongly agree. When asked if their expectations of the rotation were met, 4 of 25 (16%) of students said that they agreed that their expectations were met, whilst 21 of 25 (84%) strongly agreed that their expectations were met. When asked if their expectations were exceeded, 16 of 25 (64%) strongly agreed, 6 of 25 (24%) agreed and 3 of 25 (12%) neither agreed nor disagreed. When asked if the anesthesia rotation increased their desire to pursue a career in anesthesia, 24 of 25 (96%) strongly agreed. The remaining person did not answer that question as they had already decided on a career in internal medicine before starting the anesthesia rotation. When asked if the rotation helped improve skills related to all aspects of medicine (airway management, intravenous line placement, etc.), 7 of 25 (28%) agreed, while 18 of 25 strongly agreed (72%). When asked if the rotation helped improve their knowledge of anesthesia, 3 of 25 (12%) agreed while 22 of 25 (88%) strongly agreed. Finally, when asked if the rotation helped improve their knowledge of general medicine, 3 of 25 (12%) neither agreed nor disagreed, 8 of 25 (32%) agreed and 14 of 25 (56%) strongly agreed.

3. Improvement of the clerkship

Students were asked to comment on what they enjoyed and what they thought could be done to improve the rotation and make it more worthwhile.

Students found the following beneficial:

- All students stated that they received a broad picture of anesthesia with an effective showcasing of anesthesia.
- The rotation ensured a good overview of the different practices in anesthesia and the diversity of the field of anesthesia.
- All students felt their schedule was well structured and included something definitive to do every day.
- Seventy five percent of students stated that they got a good feel for our residency program.
- Working with many of the same residents every day allowed rapport to be developed, and thus all students felt they were allowed some degree of independence.

Some of the comments and suggestions for improvement included:

- Desire for continuity with staff anesthesiologists.
- Exposure to trauma, pediatric or obstetric anesthesia.
- To limit time spent in PACU.
- To increase time spent in SICU.
- To increase the number of scheduled didactic lectures.

Although we do not have data on how many of these students eventually choose a career in anesthesiology, we do know that 6 of the 25 students (24%) took residency positions in anesthesiology in our facility.

Discussion

Despite the recent increasing popularity of anesthesiology as a career choice, it is necessary to improve the quality of education of students and continue to attract medical students into the specialty. Continuing recruitment ensures that there will be enough anesthesiologist to fill future positions. Analysis of comments listed by the students surveyed provides valuable insight and contributes significantly to our ongoing efforts to improve our anesthesia clerkship. Our anesthesia clerkship was initially structured to include 10 days in the general operating room, 2 days in the PACU, 1 day in the PACE clinic, 2 days in SICU, 3 days on the acute pain service and 2 days on the regional anesthesia service. As well as this, students attended resident based lectures, grand rounds and had an in-depth feedback and review of their clerkship at the end of their month with us. The results showed an overall satisfaction with the clerkship and an enthusiasm towards a career in anesthesia.

The National Residency Match Program (NRMP) is one of the biggest recruitment avenues for anesthesia residencies the United States of America. In 2008, 75% of available residency positions were recruited through the NRMP at the CA-1 level. Although the popularity of anesthesia as a career choice has increased in recent years in the U.S., with only 56 unfilled positions offered via the National Residency Matching Program in 2010 (4% unfilled positions) compared to 622 unfilled positions in 1996 (65% positions unfilled), it is still crucially important

to continue to inspire students to join the field of anesthesia and ensure that enough graduate and continue to fill available anesthesia positions.^{1,2,3}

Many medical students have very limited knowledge of the scope of the field of anesthesia. One study showed that 82.5% of medical students were unaware of the variety involved in anesthesia; some not even realizing that anesthesiologists were doctors.⁴ Onrubia et al. conducted a survey on medical students who had not yet worked in a hospital. Of these students, 78.4% believed that the anesthesiologists function did not go beyond warning the surgeon of changes in vital signs.⁵ Although these studies were not conducted in U.S. medical schools and may not reflect U.S. medical students' attitudes, they do give us a global glimpse on attitudes towards anesthesiologists. Closer to home, Adudu et al. conducted a survey on Canadian medical students to evaluate their attitudes and perceptions towards anesthesiology. They reported that less than one third of students' ascribed roles, such as operating room management, and expertise in resuscitation, acute/chronic pain management and fluid management to anesthesiologists and identified an inconsistent understanding of the roles of anesthesiologists among students.⁶ This ignorance regarding the field may play a role in students' lack of interest in pursuing anesthesia as a career choice. There is little data available on American medical students' attitudes towards anesthesiologists; however, based on the studies above, we may assume that they may be similar in nature.

Better exposure of medical students to anesthesia can increase their awareness of the range of the specialty. A survey by Samra et al. showed that after a 4 week clinical clerkship in anesthesiology, the students' perception of an anesthesiologist changed significantly. Their results suggested that a clinical anesthesia clerkship improved students' attitudes towards anesthesiologists as physicians. They also suggested that the clerkship may have a possible impact on future career choices as well as providing them with a worthwhile clinical experience.⁷ Mishra stated that we should aim to train medical students not to gain competence in anesthesia sufficient for clinical care, but to produce better informed students who are aware of the roles played by anesthesiologists, and that this exposure may act as a motivating factor for them to consider training in anesthesia.⁸ Even if a student does not decide upon a career in anesthesia, the anesthesiology clerkship provides them with a means of improving the image of anesthesiologists as physicians and provides an opportunity to acquire skills and knowledge transferable to other areas of medicine. Rosenberg stated that even a short rotation such as a week can provide the student with the understanding of the scope of the specialty and can be helpful in knowing even when to call an anesthesiologist as a consultant.⁹ As Jakhrani et al. (1990) commented, "the discrepancy in the small percentage of students who would choose anesthesia as a career compared to the large percentage who found the specialty interesting could be altered if more time were dedicated to the practical teaching of anesthesia."¹⁰ In the study by Adudu et al. conducted on Canadian medical students to evaluate their attitudes and perceptions towards anesthesiology, they stated that the top reasons for rejecting anesthesiology as a career choice included lack of knowledge or low exposure to anesthesia. Fifty percent of Year 4 students who had not ranked anesthesia in the top three would have considered doing so had they completed an anesthesia rotation before having to make career choices.⁶ Another study suggests that a comprehensive anesthesia curriculum is not necessarily recommended, but emphasis should be placed on anesthesiologists teaching a broad range of knowledge and skill to

students and new doctors.¹¹ This in itself could expose students and newly qualified doctors to the range of knowledge and clinical experience an anesthesiologist has to offer.

Improving the structure of a clerkship does have a positive impact on the number of students wanting to participate in the clerkship. Word of mouth regarding a successful anesthesia clerkship can lead to other students requesting the clerkship.¹² Having a positive role model influences the career choice in anesthesia.^{13,14}

The feedback given to us by the students allowed us to focus on where our deficits may lie and thus allow us a means to further improve the clerkship and continue to encourage student interest in anesthesia.

Conclusion

The response to our survey showed that a structured educational four week anesthesia clerkship was highly satisfactory and increased students' desire to pursue a career in anesthesia with 96% of students stating that the clerkship increased their desire to pursue a career in anesthesia. Although we do not have data on how many students eventually choose a career in anesthesiology, we do know that 6 of the 25 students (24%) took residency positions in anesthesiology at our facility.

Since the survey, based on the feedback given by the students, we continue to improve the anesthesia clerkship by having a staff anesthesiologist mentor each student individually, allowing the student to experience other areas of anesthesia such as pediatrics and cardiac and by increasing the amount of didactic teaching without impinging on their time spent in the operating room. Based on the students' requests, we decreased time in PACU and increased time spent in the SICU. Students report an overall satisfaction with the clerkship in particular with the didactic teaching sessions, and we continue to obtain the surveys from the students upon completion of their rotation for future review. We are hoping that the positive response from medical students in our study will encourage residents and attendings to be proactive in the teaching of students. We plan on continuing to survey medical students to ensure the program remains to their satisfaction and, if possible, follow up to see how many eventually choose anesthesiology as a career. With further improvement, we hope to continue to promote anesthesia as a career choice to medical students. The future of the field of anesthesia may be influenced by how committed the departments are to teaching and encouraging medical students. In doing so, our aim is to ensure recruitment of solid medical students into our residency and develop well rounded anesthesiologists.

References

1. Schubert A. National Residency Matching Program Results for 2007. American Society of Anesthesiology Newsletter. 2007 Jun. Vol 71.
2. Schubert A. Recruitment from U.S. Medical Schools Continues to Grow, PG-1 now Exceed CA-1 positions. Anesthesiology Newsletter. 2009 July. Vol 73.
3. www.NRMP.org
4. Adudu OP. What impressions do medical students of the University of Benin have about anaesthesia and anaesthesiologists?. Nigerian Postgraduate Medical Journal. 2005 Dec. 12(4):250-4.
5. Onrubia X. de Andres J. Valia JC. Bolinches R. Analysis of knowledge about the anesthesiology specialty among a population of medical students. Revista Espanola de Anestesiologia y Reanimacion. 1995 Oct. 42(8):324-9.
6. Adudu OP. Le N H. Devito I. Campbell FA. Levine MF. Medical student impressions of anesthesiology and anesthesiologists. Can J Anesth. 2010. 57:792-793.
7. Samra SK. Davis W. Pandit SK. Cohen PJ. The effect of a clinical clerkship on attitudes of medical students toward anesthesiology. Journal of Medical Education. 1983 Aug. 58(8):641-7.
8. Mishra LD. Anaesthesia and medical student education. Anaesthesia & Intensive Care. 2006 Apr. 34(2):282.
9. Rosenberg H. Anesthesia orientation for the medical student. Anesthesia & Analgesia. 1975 May-Jun. 54(3):328-31.
10. Jakhrani NK. Rabadi BH. Preference of anaesthesia as a career. JPMA - Journal of the Pakistan Medical Association. 1990 May. 40(5):121-2.
11. Rohan D, Ahern S, Walsh K. Defining an anaesthetic curriculum for medical undergraduates. A Delphi Study. Medical Teacher. 2009 Jan. 31 (1) 1-5.
12. Lin YC. Improving the Anesthesiology Clerkship for Medical Students. Journal of Education in Perioperative Medicine. Sept-Dec 1999. Vol 1, issue 3.
13. Roberts LJ. Khursandi DC. Career choice influences in Australian anaesthetists. Anaesthesia & Intensive Care. 2002 Jun. 30(3):355-9.
14. Watts RW. Marley J. Worley P. Undergraduate education in anesthesia: the influence of role models on skills learnt and career choice. Anaesthesia & Intensive Care. 1998 Apr. 26(2):201-3.