

# HOW DO IN-TRAINING EXAMINATION SCORES TREND WITH ATTENDANCE AT DIDACTIC SESSIONS? A RETROSPECTIVE AUDIT OF ANESTHESIOLOGY RESIDENTS AT AN UNIVERSITY-AFFILIATED RESIDENCY PROGRAM IN THE UNITED STATES

DEEPAK GUPTA<sup>1</sup>, HASSAN H. AMHAZ<sup>2</sup>, ELIE JOSEPH CHIDIAC<sup>1</sup>, SHUSHOVAN CHAKRABORTTY<sup>1</sup> AND PRANAV PATEL<sup>1</sup>

## Acknowledgements

The authors are indebted to inspirational teachers, Emeritus Professor Harold Michael Marsh MBBS and Konstantin Rusin MD PhD, Department of Anesthesiology, Detroit Medical/Center/Wayne State University, Detroit, Michigan. The authors are thankful to George Mckelvey, PhD, Research Associate, Department of Anesthesiology, Detroit Medical/Center, Detroit, Michigan, for help with copyediting the manuscript.

## Abstract

**Background:** The Accreditation Council for Graduate Medical Education (ACGME) recommends that residents attend didactic lectures as part of their medical education during their tenure at ACGME-accredited residency programs. However, for anesthesiology residents, there are no specified minimum attendance requirements.

**Objectives:** To assess (a) the trend in attendance at didactics for anesthesiology residents from first clinical anesthesia year (CA-1) to final clinical anesthesia year (CA-3) and (b) whether their residency training examination scores (Anesthesia Knowledge Test: AKT scores and In-Training Examination: ITE scores) trended with their didactic attendance.

**Materials and Methods:** A review of ten years (2004-2013) didactic attendance data spanning our seven anesthesiology resident classes (2007-2013) was performed. Departmental data regarding the corresponding residents' examination scores over the same review period was also collected.

**Results:** Didactic attendance data and in-training score data was analyzed for 47 anesthesiology residents. The average didactic attendance decreased from 70%-80% in CA-1 year to 40%-50% by CA-3 year { $p < 0.05$ }. However, the corresponding decrease in average national percentile scores among our residents from the high 60s in CA-1 year ITE to the high 50s by CA-3 year ITE was not statistically significant, although decreased average national percentile scores among our residents in AKT-18/24 (as compared to AKT-POST and AKT-6) was approaching statistical significance { $p=0.06$ }.

1 Department of Anesthesiology, Detroit Medical Center-Wayne State University, Detroit, Michigan, USA.

2 Department of Cardiothoracic Anesthesiology and Critical Care, Duke University Medical Center, Durham, North Carolina, USA.

**Corresponding Author:** Dr. Deepak Gupta, Clinical Assistant Professor, Anesthesiology, Detroit Medical Center-Wayne State University, Box No. 162, 3990 John R, Detroit, MI 48201, USA. E-mail: dgupta@med.wayne.edu

**Conclusion:** Although quality of medical education may be difficult to quantify solely based on the physical attendance during didactic sessions, resident didactic attendance should be monitored during the residency training as a potential factor impacting resident performance on in-training examinations.

**MeSH Keywords:** Education, Medical, Graduate; Internship and Residency; Anesthesiology; Knowledge; Certification.

## Background

The Accreditation Council for Graduate Medical Education (ACGME) recommends that residents attend didactic lectures as part of their medical education-training during their tenure at an ACGME-accredited residency program. The ACGME minimum requirements vary by specialty<sup>1-3</sup>. However, for anesthesiology residents, there are no specified minimum attendance requirements<sup>3</sup>. Additionally, the anesthesiology residents are familiar with two types of tests during their residency: The Anesthesia Knowledge Tests (AKTs)<sup>4</sup> and The In-Training Examinations conducted by the American Board of Anesthesiology (ABA-ITEs)<sup>5</sup>. The AKTs include (a) Baseline AKT-PRE: prior to anesthesiology orientation, (b) AKT-POST: post anesthesiology orientation month, (c) AKT-6: six months into clinical anesthesia training (denoting the first clinical anesthesia year: CA-1), and (d) AKT-18/24: eighteen months into clinical anesthesia training (denoting the second clinical anesthesia year: CA-2). The ABA-ITEs include (a) Baseline PGY-1 ABA-ITE in the first post graduate year (internship year), (b) CA-1 ABA-ITE in the first year of clinical anesthesia residency: CA-1, (c) CA-2 ABA-ITE in the second year of clinical anesthesia residency: CA-2, and (d) CA-3 ABA-ITE FINAL in the third (final) year of clinical anesthesia residency: CA-3.

The objective of our retrospective audit was to assess the trend in didactic attendance for anesthesiology residents from their CA-1 year to their CA-3 year and to analyze if their residency training examination scores (AKT scores and ABA-ITE scores) trended with their didactic attendance.

## Materials and Methods

After obtaining Institutional Review Board assent (Non-Human Participation Research) for this retrospective audit, we reviewed ten years (2004-2013) of didactic attendance data spanning seven classes (2007-2013) of our anesthesiology residents at Detroit Medical Center/Wayne State University. Existing departmental data on didactic attendance was anonymously (independently de-identified residents) tabulated according to the following: percentage lecture attendance for (a) Monday afternoon didactics, (b) Wednesday morning didactics, and (c) Wednesday afternoon didactics during each resident's three-year residency. Additionally, departmental data regarding the corresponding residents' national percentile scores in their examinations was anonymously tabulated. This examination score data included: (a) scores on the United States Medical Licensure Examination (USMLE) Step I, II and III, (b) AKT scores and (c) ABA-ITE scores. After collection of the didactic attendance and examination score data, the means (of percentiles and percentages) were compared (ANOVA: analysis of variance) with  $p < 0.05$  being significant.

## Results

During 2007-2013, complete didactic attendance data and in-training score data was analyzed for 47 anesthesiology residents. Among these residents (Figures 1 and 2), average USMLE Step III scores in high 80s were significantly less compared to average USMLE Step I and Step II scores in low 90s ( $p < 0.001$ ). The average didactic attendance decreased from above 70% in the CA-1 year to below 50% by the CA-3 year ( $p < 0.001$ ). However, the corresponding decrease in average national percentile scores among our anesthesiology residents from the high 60s in the CA-1 year ABA-ITE to the high 50s by the CA-3 year ABA-ITE was not significantly significant, although decreased average national percentile scores among our residents in AKT-18/24, as compared to AKT-POST and AKT-6, was approaching statistical significance ( $p = 0.06$ ).

Fig. 1  
 United States Medical Licensure Examination Scores of Our Anesthesiology Residents  
 and Their Attendance In Lectures During Their Three Clinical Anesthesia Years

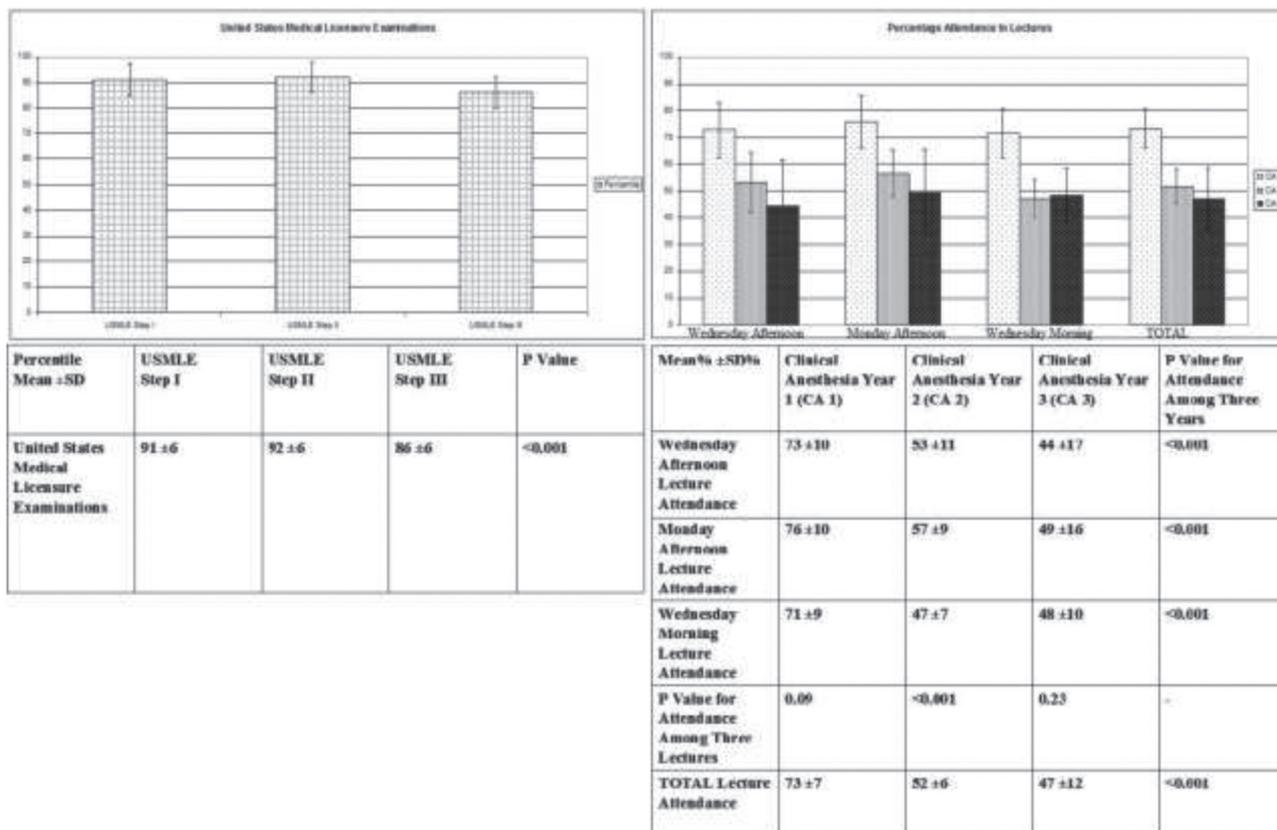
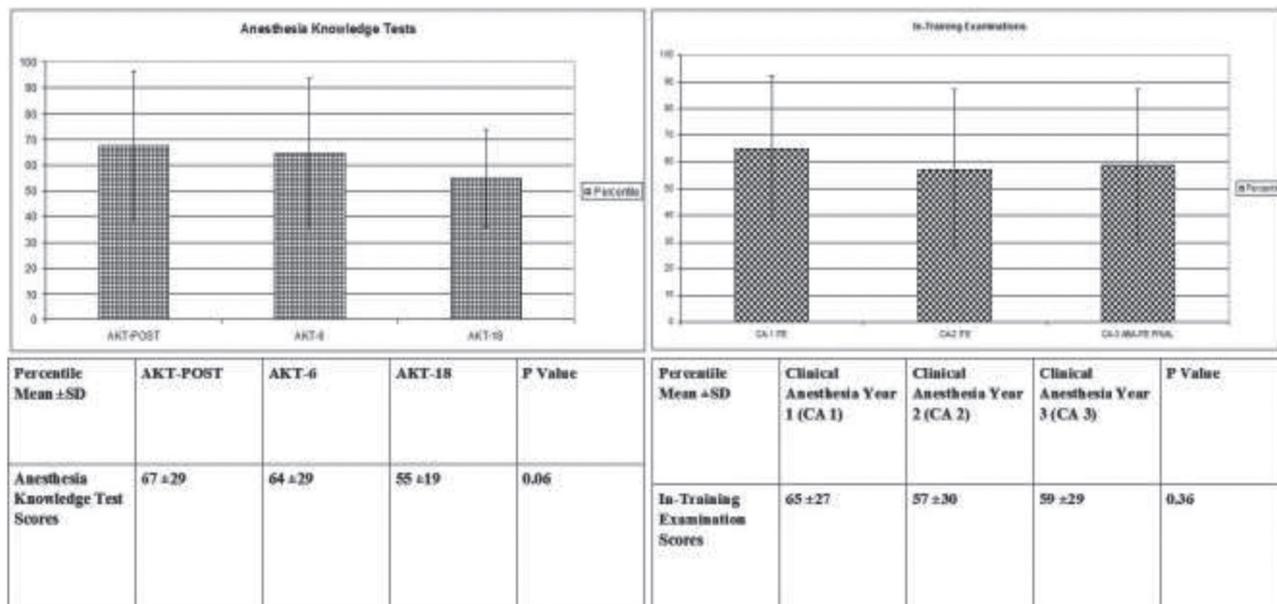


Fig. 2  
 Anesthesia Knowledge Test Scores and American Board of Anesthesiology  
 In-Training Examination Scores of Our Anesthesiology Residents



## Discussion

Our results observed that as our anesthesiology residents progressed from their first year to their third year of residency, there was a significant decrease in their didactic attendance. This progressive decrease is likely secondary to an increased number of excused absences secondary to senior residents involvement in more clinically demanding subspecialty rotations as well as more frequent off-site clinical rotations. Alternatively, didactic attendance might have decreased due to the didactic content being not tailored to the residents' level of training or their clinical experience years. Interest among senior residents in the didactic lectures geared towards previously learned basic concepts could have presumably waned as residents' clinical experience level progressed. Even though the average Monday afternoon didactic attendance (primarily given by the associate program directors) was the highest, there was still a decrease in attendance as residents progressed in their training.

In regards to ABA-ITE scores, the non-significant yet declining trends in national percentile scores of our anesthesiology residents over their three years of residency suggest the decrease in scores may in fact be influenced by the declining trends in didactic attendance with residency training year. However, the statistically non-significant decrease in scores (despite statistically significant decrease in didactic attendance) suggests that residents may have been able to sustain their scores independent of didactic participation by alternative methods including informal day-to-day and intra-operative teaching as well as personal resolve to learn and perform well on such examinations. Alternatively, the decrease (instead of increase) in our anesthesiology residents' percentile scores relative to other programs nationally signifies that our residents may not be benefiting from the formal lectures

provided to them during their residency training.

What we may deduce from this data is that our residency didactics should be appropriately tailored to residents' level of training to sustain their educational interest levels. Moreover, improvement in attendance rates may be feasible only when the clinical scheduling for all residents is uniformly matched corresponding to the didactic scheduling.

Our review has some limitations. Firstly, it is a retrospective audit limited to our anesthesiology residents' attendance and their performance. Secondly, only the physical attendance was quantified during this retrospective review; however, if a prospective study had been planned, the actual immediate retention of the educational material discussed in the didactic sessions could have been better assessed with corresponding pre-session and post-session questionnaires. Finally, the spectrum of the educational topics covered during the ten-year worth didactic sessions was NOT analyzed which could have given comprehensive and deeper insight into residents' corresponding performance on the topic-related questions during AKTs and ABA-ITEs.

## Conclusion

Although it may be difficult to quantify the quality of medical education solely based on the physical attendance during didactic sessions, it cannot be overlooked during the residency training. Its impact may reflect in the residents' performances on their in-training examinations which along with the specialty board certification examinations, evaluate and judge whether the residents (and potential future physicians) know how to safely practice medicine and whether they will eventually be able to do so.

## References

1. ACGME.org ACGME Program Requirements for Graduate Medical Education in Ophthalmology, July 1, 2016 [https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/240\\_ophthalmology\\_2016.pdf](https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/240_ophthalmology_2016.pdf) Last Accessed on March 31, 2017.
2. ACGME.org ACGME Program Requirements for Graduate Medical Education in Emergency Medicine, July 1, 2016 [https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/110\\_emergency\\_medicine\\_2016.pdf](https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/110_emergency_medicine_2016.pdf) Last Accessed on March 31, 2017.
3. ACGME.org ACGME Program Requirements for Graduate Medical Education in Anesthesiology, July 1, 2016 [https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/040\\_anesthesiology\\_2016.pdf](https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/040_anesthesiology_2016.pdf) Last Accessed on March 31, 2017.
4. MetricsInc.org The AKT & The IHSGAE <http://www.metricsinc.org/akt-testing.html> Last Accessed on March 31, 2017.
5. The ABA.org In-Training Examination <http://www.theaba.org/TRAINING-PROGRAMS/In-training-Exam/About-the-In-Training-Exam> Last Accessed on March 31, 2017.

