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Effect of protected research time on ABSITE scores during general surgery residency

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ABSTRACT

Background: Objective - To determine whether residents with one or more years of dedicated research time (Research Residents, RR) improved their ABSITE scores compared to those without (Non-Research Residents, N-RR).
Methods: A retrospective review of general surgery residents' ABSITE scores from 1995 to 2016 was performed. RR were compared to N-RR. Additional analysis of At Risk (AR) v Not At Risk residents (NAR) (<or >35th percentile as PGY1-2) was also performed.
Results: Cohort - 147 residents (34 RR and 113 N-RR). There were no differences in initial ABSITE scores ($p = 0.47$). By definition, the AR group had lower scores than NAR. Overall, post-research RR v PGY-4 N-RR scores did not differ ($p = 0.84$). Only the AR residents improved their scores ($p = 0.0009$ v NAR $p = 0.42$), regardless of research group ($p = 0.70$).
Conclusion: Protected research time did not improve residents' ABSITE scores, regardless of initial scores. At Risk residents improved regardless of research group status.

1. Introduction

The ABSITE (American Board of Surgery In-service Training Exam) is a required yearly written examination of general surgery residents in the United States designed to assess surgical and medical knowledge. Overall scores are provided as absolute percentage of correct answers and as a percentile relative to all residents at the same level. In addition, seven subset scores are calculated for Basic Science, Clinical Management, and five clinical systems. The test is administered in January of each year to all residents in each of their five years of general surgery training as well as during each year of protected research. The results of the ABSITE, in addition to other parameters, are used to assess resident progression through training.[1–3]

Medical research is felt by many educators to be a vital component of the education of physicians, and scholarly activity is a required component of surgical education.[4] Residents usually participate in clinical research during their 5 years of clinical training; and many programs encourage or require residents to take time off from their clinical training to dedicate one to two years to research. During this time, they are usually free from clinical responsibilities and would be expected to have more free time.

The Rush University Medical Center General Surgery Residency Program is a 5-year clinical program that provides the opportunity for categorical residents to take 1 or 2 years of protected research time off after their Post Graduate Year (PGY) 2 or PGY 3 level of surgical training. Protected research time is not mandatory; usually 2 to 3 residents per class wish to avail themselves of this opportunity. There are two schools of thought regarding who should be allowed to take time off for research – one, as a reward for outstanding clinical and exam performance during the first two clinical years and the desire to pursue an academic career, and two, to give residents who have performed poorly on the ABSITE additional time to study and catch up to their peers. The purpose of this study was to assess the effect of protected research time on General Surgery residents' ABSITE scores. The hypothesis was that residents who took one to two years off for protected research (Research Residents, or RR) would significantly increase their post-research ABSITE scores compared to residents who did not (Non-Research

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Residents, or N-RR).

2. Materials and methods

This study was a retrospective review of General Surgery resident ABSITE scores over the 21 years from 1995 to 2016 at a large urban program with 8 categorical residents per year. Residents who took one to two years off for protected research (Research Residents, or RR), were compared to residents who did not do so and went directly through the 5 years of clinical training (Non-Research Residents, or N-RR).

For the research residents (RR), the scores from the clinical year before their research were used as their pre-research scores, and scores from the first clinical year following completion of their research were used as their post-research scores. Because residents did not go out for research uniformly, we chose to use the PGY-2 and PGY-4 scores for the non-research residents since they most closely paralleled the pre- and post-research years for the research residents.

In addition, we evaluated residents based on how they scored during their first two years of ABSITE exams. They were divided into At Risk (AR) and Not At Risk (NAR) groups. Those who had scored in less than the 35th percentile for their academic year in either of their first two years of residency were designated At Risk and were compared to those who had scored above the 35th percentile - Not At Risk.

During the study period, there were 167 categorical residents who took the ABSITE; of these, 147 residents, or 88%, (113 N-RR residents and 34 RR residents) had multi-year scores appropriate for analysis. Data was collected from the American Board of Surgery's annual ABSITE reports to the Department of Surgery and from individual departmental resident files. In addition to the ABSITE scores from each postgraduate year, United States Medical Licensing Examination (USMLE) Step 1 scores, taken during medical school, were collected to control for test-taking ability. This study was approved by the Institutional Review Board.

2.1. Statistical analysis

Statistical analyses were performed with R v3.2.0 and v3.3.2 software.[5] The primary measure used was the total relative percentile score comparing residents at the same level. This score is the main number used by program directors. Residents who took one to two years off for protected research (RR) were compared to their peers who did not (N-RR). Separately, residents were compared on how they did in their first two years of ABSITE exams. Those who had scored in less than the 35th percentile in either (or both) of their first two years of residency (At Risk, or AR) were compared to those who had scored above the 35th percentile (Not At Risk, or NAR). This cut-off was chosen because we routinely use it as a measure of those residents who need educational counseling. To control for the potential effects of test-taking ability, Step 1 USMLE scores were initially included in all analyses except the Fisher exact tests. .

Fisher exact tests were conducted to see whether there was a relationship between being at risk (AR) and taking time for dedicated research. The potential relationship between Step 1 USMLE scores and taking time for dedicated research was assessed using a Welch's *t*-test. Similarly, pre-research differences on the Step 1 USMLE scores between the AR and NAR groups, as well as the RR and NRR groups were examined using Welch's t-tests by splitting the USMLE at the median. To look at any potential pre-research differences between the groups, nested linear models were created and compared, with research group status and at risk group status as predictors and ABSITE Total Percentile in the pre-research year (PGY-2) as outcome.

To examine how dedicated research time may affect ABSITE scores, difference scores were calculated for the RR group by subtracting the percentiles for the Total ABSITE scores for the year before research from the percentiles for the year after. Similar difference scores were calculated for the N-RR group, using ABSITE percentiles for PGY-2 and PGY-4, the years that most closely paralleled the pre- and post-research years of the research residents. Nested linear models were created and compared to examine the effects of a research year, being in the At Risk (AR) group, or the interaction between the two on the difference scores. Welch's t-tests were done for post-hoc testing, including single-sample tests against zero.

To look at potential differences among groups after research, the percentiles for the Total ABSITE scores for the year following research were used for RR, and the PGY-4 score was used for N-RR. Nested linear models were created and compared, with Research group status and At Risk group status as predictors and the ABSITE scores as the outcome.

3. Results

3.1. Pre-research differences

The At Risk (AR) group and the Not At Risk group were clearly starting at different ABSITE score levels by definition (<or >35th percentile PGY-2 scores, Fig. 1). Using a Fisher exact test, there was no relationship between At Risk (AR) group status and Research (RR) group status; in other words, being AR did not statistically seem to influence whether a resident was allowed to take time off for research overall ($p > 0.99$, Table 1). Similarly, there was no relationship between USMLE scores and being allowed to take time off for research ($p = 0.24$). There was no interaction between At Risk (AR) group status and Research (RR) group status on ABSITE Total Percentile score for the year before research (for RR), and PGY-2 (for N-RR) ($p = 0.93$). Similarly, no significant differences were seen between the RR and the N-RR groups ($p = 0.47$, Table 1).

3.2. Controlling for USMLE scores

Scores from the Step 1 of the USMLE were used to control for

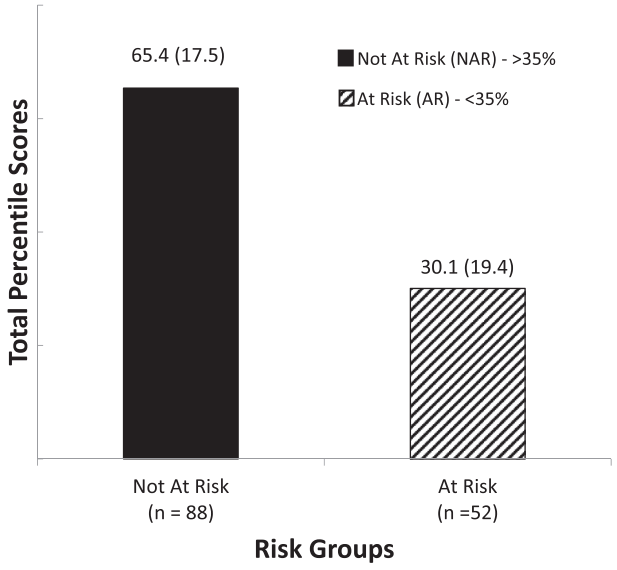

Fig. 1. Pre-research ABSITE total percentile scores by risk groups – Mean (SD).

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