

# Improving Methodology for Identifying High-Performing Trainees

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## Abstract

### BACKGROUND:

The post-graduate medical application and match process does not allow optimal identification of individuals who will perform well during training.

### OBJECTIVE:

A model of the application process can be created to test the hypotheses that one or more factors can be used to predict success during post-graduate medical training.

### METHODS:

Retrospective data from graduates of the Emory University School of Medicine's Pulmonary and Critical Care Medicine Fellowship from 2007 through 2019 will be examined to identify different phenotypes of recruits to the program; a multivariate analysis will be performed to examine factors that could potentially be used ad hoc to identify trainees likely to have similar phenotypes in a prospective fashion.

### RESULTS:

Data collection is ongoing.

## Methods

Data from the last thirteen years of graduates of the Emory University School of Medicine's Fellowship Program in Pulmonary and Critical Care Medicine were used to develop a predictive model that could be used prospectively to identify future high-performing trainees during the process of reviewing their applications and interviewing them; a total of fifty-five trainees' data will be analyzed. With the exception of interview scores, all data regarding former trainees were provided by the fellows themselves as a required component of the fellowship application process. These fellows will not be asked for any additional data. The data extracted from the application packets included:

- Age at start of fellowship training
- Sex
- USMLE 1 score
- USMLE 2 score
- USMLE 3 score
- Any failure of any USMLE step
- Quality of medical school (quartiles)
- AOA status
- Quality of residency program (quartiles)
- Performance of a chief resident year
- Number of years between ending residency and starting fellowship
- Prior PhD
- Prior Masters-level degree
- Number of regional / national presentations
- Number of publications in the peer-reviewed scientific literature
- Quality of letters of recommendation (quartiles)
- Interview scores from Division leadership
- Rank list order

Faculty who have been involved in the fellowship training program for at least ten of the last thirteen years were asked to provide an anonymous assessment of these graduates using a Google form. This form asks faculty to classify each of these former fellows into one of five different categories, based upon the perceived quality of their overall performance during their training, ranked from "outstanding" to "disaster", each with specific descriptive anchors for faculty reference.

## Methods (cont.)

Multivariable analysis will be performed with the mean faculty rating of each graduate as the independent variable, and each data point extracted from the application and interview serving as a potential contributor to this outcome for analysis. It is likely that some of the dependent variables will be highly correlated (as one example, faculty providing interview scores are not blinded to applicants' packets; these scores may therefore correlate with other applicant data). The analysis will therefore also include assessment of confounding amongst the potential dependent variables.

The major challenge of this study is the lack of an objective metric for learner performance. Different faculty may weight different aspects of learner performance variably, which may cause inconsistency of fellow grading. In addition, faculty may have poor recall of individual learner performance, particularly for trainees who trained farther in the past. Lastly, even if the data we collect provides value to our own program for use prospectively, it is likely that the data would not be generalizable to other programs because of the variability of institutional and programmatic cultures.

The Institutional Review Board of Emory University has deemed this project exempt from the need for formal review.

## Planned Timeframe

|                                       |                           |
|---------------------------------------|---------------------------|
| Completion of survey by faculty       | September, 2019           |
| Curation of data from learner records | October, 2019             |
| Data analysis and manuscript draft    | November - December, 2019 |

## Expected Results

While I am hopeful that we will be able to find a reliable predictor of future trainee performance among the mass of data we collect during the application and interview process, my suspicion is that we will only be able to identify weak correlates of performance. In addition, I suspect that the faculty, who believe that their interview assessments are at least somewhat predictive of success, will discover their subjective assessments add nothing to the objective data gleaned from the applicants' records.

## References

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## Background & Purpose

Each July, almost thirty thousand medical professionals are appointed to first-year post-graduate positions through the National Residency Matching Program. The process of identifying applicants to post-graduate training programs who warrant interviews, and who subsequently warrant recruitment, is problematic. Training program directors and faculty are often not able to triage high-quality candidates appropriately, and not infrequently end up recruiting housestaff who pose challenges related to professionalism, interpersonal skills, and a number of other metrics critical to the performance of a physician. To date, no studies have determined that any criteria available during the recruitment period can be used to identify trainees who will perform well after recruitment, though some data exist suggesting that board scores are poor predictors of professional performance. This study was performed to help our own program improve the recruitment process, looking at historical data using a multivariate analysis to identify best predictors for post-graduate success.