

ABSTRACT

Objective: Determine the impact of an algorithmic approach - with no USMLE “cutoff” score - on the quality of applicants selected for residency interviews.

Study Design: Retrospective cohort study of medical student applicants and current residents

Settings and Methods: Single institution review of otolaryngology residency program applications (n=365) from 2008 to 2015. An algorithm was introduced to the selection process in 2013 in which no USMLE cutoff score was needed to receive an interview. In addition to applicants, we analyzed characteristics of residents who successfully matched into our program. Pre-algorithm residents (n=16) and post-algorithm residents (n=12) were compared to assess the impact of this approach on characteristics of successfully matched residents at the program.

Results: Applicant pools pre- and post-algorithm displayed similar characteristics. Interestingly, while there was no USMLE “cutoff,” scores significantly increased post-algorithm. The proportion of residents with a regional connection increased significantly post-algorithm. The algorithm also aided in the overall applicant screening process, reducing the needed time without impacting the overall composition of the interviewee pool.

Conclusion: Historic means of screening residency applicants are not uniform and often employ a simple USMLE score cutoff. This is neither the purpose of the exam nor an effective means of selecting the best future otolaryngologists. Applications can be objectified using an algorithmic approach, saving time and without negatively impacting the selection pool. Furthermore, while weighting attributes such as leadership and research equally with the USMLE score, we experienced an increase in average USMLE score of interviewed applicants.

INTRODUCTION

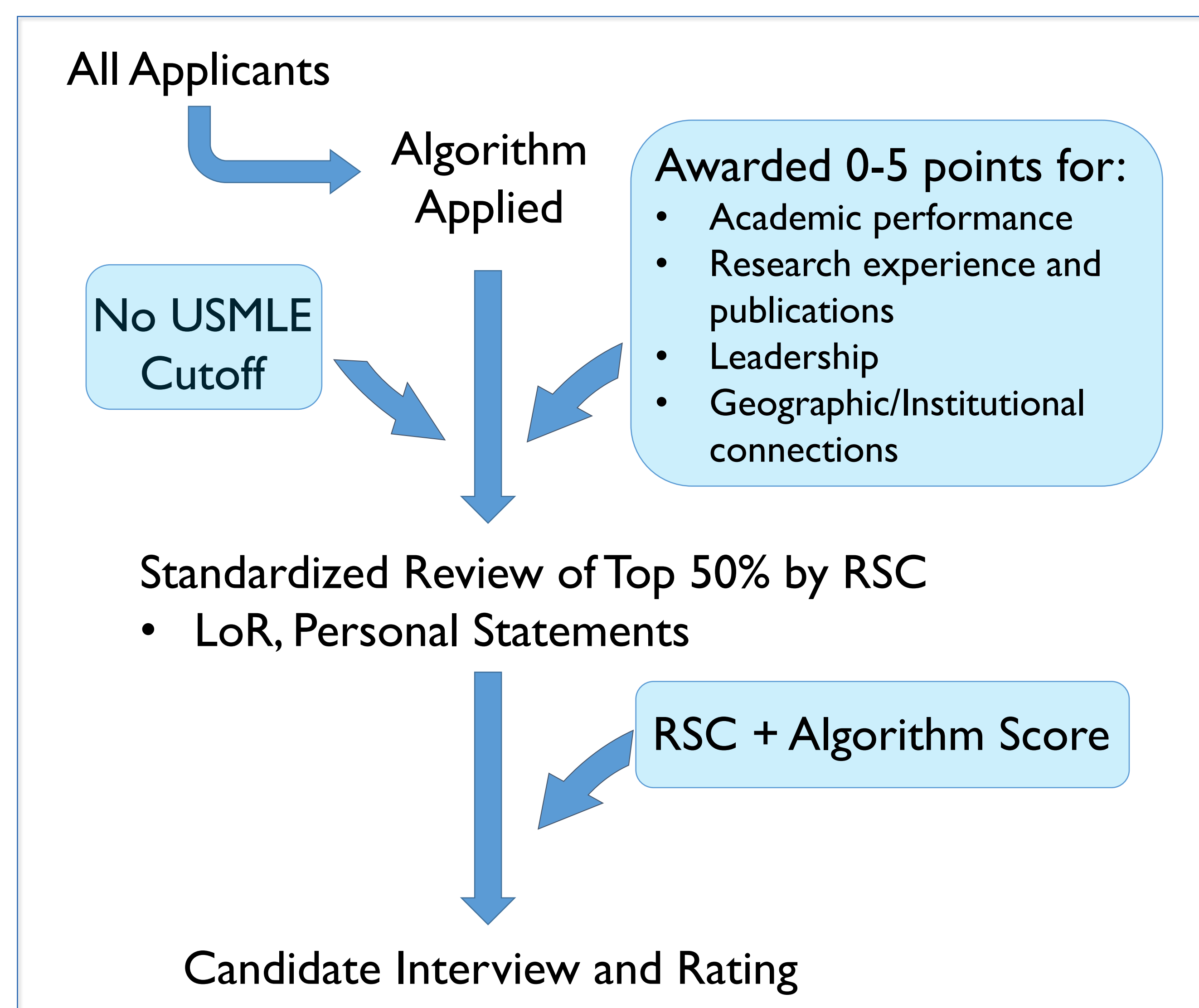
“The Match” has been the process through which medical students attain residency training positions since 1952. This process has become increasingly competitive; in 2015 there were 41,334 applicants for 27,293 PGY1 positions. On average, approximately 500 students apply for the roughly 300 available PGY1 otolaryngology positions. This has caused students to apply to more programs. In the 2014-2015 Match, the average student applied to 62 programs which translates to an average of 272 applications per program. In response, many training programs have instituted minimum standards or “cutoffs” to help whittle down the applicant pool to select those who will receive interview invites. Many simply use the USMLE score as a cutoff with those failing to achieve a minimum score eliminated from consideration as candidates.

We believe there is a better way and present our findings on how a single institution developed an algorithmic approach to resident selection that incorporates multiple facets of applicants, beyond just the USMLE score.

OTOLARYNGOLOGY SPECIFIC MATCH INFO

- Otolaryngology is a highly competitive and desirable surgical subspecialty that consistently draws a talented pool of applicants.
- Mean USMLE score
 - 2006 – Step 1 – 238
 - 2015 – Step 1 – 248
- Mean research experiences
 - 2006 – 3.2
 - 2015 – 4.7
- Misrepresentation of scholarly activities
 - 12% applicants to Canadian otolaryngology programs misrepresent publications
- Program-specific paragraph in the Personal Statement instituted - 2015
- Otolaryngology Residency Talent Assessment implemented - 2016

Figure 1. Residency Selection Process



MATERIALS AND METHODS

IRB approval obtained for retrospective analysis of the interview selection process from 2008 – 2015. Applicant classes were divided into 2 groups:

- Pre-algorithm (2008-2012)
- Post-algorithm (2013-2015)

These data were compared to historical standard selection to ensure applicant interview pool characteristics remained consistent. Characteristics of residents successfully matching into our program were also analyzed.

Point based algorithm developed in SPSS and hosted on REDCap was used to screen and score applicants. Scoring was in accordance with priorities established by the Resident Selection Committee (RSC) (Figure 1)

We implemented a web-based tool, ResidentRank® to expedite the candidate interview rating process. The system compiles faculty evaluations to create average rankings and scores for the entire group. (Figure 2)

Table 1. Applicant Characteristics

Characteristic	Matched Residents	Pre-Algorithm	Post-Algorithm
Mean Step 1 (SD)	246.9 (11.3)	245.1(11.8)	250.9 (10.5)
Mean Step 2 (SD)	254.1 (7.8)	252.7 (12.2)	258.5 (11.5)
AOA	50%	51%	54%
Midwest Connection	82%	59%	68%

REFERENCES

- National Resident Matching Program, Results and Data: 2015 Main Residency Match®. National Resident Matching Program, Washington, DC. 2015.
- AAMC Electronic Residency Application Survey Data. Table C-4: Residency Applicants from U.S. M.D.-Granting Medical Schools by Specialty, 2010-2011 through 2015-2016.
- National Resident Matching Program, Charting Outcomes in the Match, 2007, 2009, 2011, 2014. National Resident Matching Program, Washington, DC 2007, 2009, 2011, 2014.
- Kaplan AB, Riedy KN, Grundfast KM. Increasing Competitiveness for an Otolaryngology Residency: Where We Are and Concerns about the Future. *Otolaryngol Head Neck Surg.* 2015;153(5):699-701.
- Naclerio RM, Pinto JM, Baroody FM. Drowning in applications for residency training: a program's perspective and simple solutions. *JAMA Otolaryngol Head Neck Surg.* 2014;140(8):695-696.
- Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform.* 2009;42(2):377-381.

Table 2. Selected Screening Algorithm Components

	Matched Residents (n=28)
Leadership Positions	
Low (0-3 Positions)	19 (67%)
High (4 or more)	9 (33%)
Research Activities	
Low (no publications)	4 (14%)
High (1 or more publications)	24 (886%)

DISCUSSION

Programs spend hours to days attempting to identify the best residency candidates. Furthermore, the average otolaryngology applicant spends over \$1,200 just submitting applications. Clearly this process has significant costs to both applicants and programs. Equally important is the fact there is more to each candidate’s potential than a test score. Our algorithmic approach sought to better incorporate the totality of each individual’s application in the selection process. For example, we equally weight leadership experience and academic performance. We feel we have been able to objectify a significant portion of the process while removing unintentional restrictions or biases.

Our screening process is more streamlined and requires less time. Furthermore, even though we do not use a USMLE “cutoff” score, in our post-algorithm cohort, we saw a rise in the average score. We have also implemented a web-based system aiming to give equal voice to the faculty members participating in interviews and expedite the ranking process.

Figure 2. Work flow using our ResidentRank® Program

CONCLUSION

The traditional application evaluation process is not ideal and fails to take into account they myriad of attributes each applicant brings to the table, especially when arbitrary cutoffs are used. An algorithmic approach can be used to screen applicants and add efficiency to the process without compromising applicant quality.

CONTACT



Kevin Sykes, PhD, MPH
University of Kansas Medical Center
Department of Otolaryngology
Email: ksykes@kumc.edu
3901 Rainbow Blvd, MS 3010
Kansas City, KS 66160