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A simulation-based selection process for trying to identify medical students who will become outstanding general surgery residents

Yazan AlJamal [a, b, c], Nicholas Prabhakar [b], Mariela Rivera [b], Travis McKenzie [b], John Stulak [b, c], Stephanie Heller [b], David R. Farley [b, *]

[a] Mayo Clinic Multidisciplinary Simulation Center, Mayo Clinic College of Medicine and Science, Rochester, MN, USA
[b] Department of General Surgery, Mayo Clinic, Rochester, MN, USA
[c] Department of Cardiothoracic Surgery, Mayo Clinic, Rochester, MN, USA

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ABSTRACT

Background: Selecting the right applicants for general surgery training is critical and difficult. We refined our selection process by using a pre-interview preparation package and simulation-based assessments.
Methods: Sixty applicants invited for categorical general-surgery residency interview were mailed an educational package which included a link to instructional videos, surgical instruments and low-cost models for suturing, open knot tying, and adrenal anatomy knowledge. During the interview day, applicants participated in a 48-min simulation-based assessment consisting of same tasks included in the package. Performance scores were used to assist in ranking applicants. The matched 2018class was compared to our previous intern classes on several objective assessments (Surgical-Olympics and ABSITE score).
Results: Students scored >50tile moved high in our final rank-list. The 2018 class scored significantly higher in 10 of 15 Surgical-Olympic stations compared to our 2015-17class with no significant difference on ABSITE score.
Conclusions: By mailing out a pre-interview welcome package and adding a simulation based assessment to our General Surgery categorical interview process, we believe early objective data suggests we positively influenced our 2018 NRMP match.

Introduction

Every year in the United States 2000 + applicants apply to general surgery training programs.[1] Since general surgery training is 5 years in length, occupies a fixed number of training spots in each program, and the specialty has historically had higher rates of attrition (10–37%),[2] it is clear that the selection and admission process is a critical evaluation exercise. Current strategies to identify successful candidates include gathering objective and subjective data on the candidates' status: Alpha Omega Alpha membership, USMLE board scores, personal statements, research experience, publications, letters of recommendation, and ultimately personal interviews to gauge interpersonal skills and professionalism.[3] However, given that a significant amount of trainees do not complete their general surgery training,[4] many because the "fit" was not good between trainee and program, the current selection process has room for improvement. Alternative methods such as a validated selection process have been proposed as theoretical solutions.[5,6]

Surgical skills are required by trainees in order to successfully graduate from the general surgery training program and obtain certification. However, little or no evaluation of surgical skills takes place in the US surgical residency application process. In Ireland, technical and fundamental abilities *are* assessed in all candidates that are pursuing a surgical residency as they have identified these abilities as important markers for predicting learning rate and performance in surgical residents.[7] We sought to determine whether the use of a technical skills assessment could give us insight into the motivation, skills and knowledge of the candidate and ultimately aide us in the selection criteria.

* Corresponding author. Professor in Surgery Department of Surgery, Mayo Clinic, 200 First Street, SW, Rochester, MN, 55905, USA.
E-mail addresses: aljamal.yazan@mayo.edu (Y. AlJamal), farley.david@mayo.edu (D.R. Farley).

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Material and methods

During the 2018 NRMP match year, all 60 applicants accepting an interview at Mayo Clinic, Rochester MN categorical general surgery residency training program were mailed a package of educational supplies in September of 2017– something we call the "pre-Welcome package" (All Mayo Clinic surgical interns matching with us in March received a "Welcome Package"). The pre-Welcome package included a formal letter from the program director (PD), surgical instruments, low-cost models, suture, and a link to our Blackboard© educational platform with instructional videos. These resources allowed the applicants to practice suturing and open knot tying, create accurate adrenal anatomy, read chest x-rays and interpret ABGs (Table 1). These tasks were chosen due to their simplicity, ease of mailing, low cost, and relevance to our surgical internship.

The PD letter provided an overview of the simulation activities and the simulation based assessments (Surgical Olympics; discussed below) in the program, clear instructions of the hands-on resources (the package) and the simulation assessment during the interview. Instructional links to videos outlined proper technique for the technical skills (knot tying and suturing) and step-by-step approaches for the knowledge skills (CXR and ABG interpretation, adrenal anatomy). Videos provided tips and tricks on how to score highly on the 5 related stations.

During the interview day, each candidate participated in a 48-min simulation-based assessment consisting of 5 different skills. The applicants were given 6 min to assemble the regional anatomy of the adrenal glands, 2 min to read two chest x-rays, and two ABGs, 6 min to demonstrate their suturing skills (single interrupted suture, single vertical mattress suture, single figure of 8 suture and running a 5 cm length in a subcuticular fashion using a simulated-skin model (Fig. 1) and 6 min to tie six 30 cm ligatures around a balloon that simulated a blood vessel (Table 2). All tasks were completed individually and were scored individually by one evaluator at each station.

PGY-1 general surgery residents helped score the medical student applicants performing the tasks using checklists that were previously developed in our simulation center curriculum for interns. These residents were instructed on the expectations and proper use of the checklist prior to the evaluation. All tasks were video recorded.

The ABGs and CXRs were scored based on the number of accurate facts that could be verbalized within the given time. The adrenal anatomy score sheet was divided into organs, arteries, and veins; each structure allows the examinee to earn two points - one for the correct name and another point for the correct placement in correlation to its surrounding structure (Fig. 2). Skin closure tasks were scored based on completion and securement of the closure (Table 3). The open knot tying station was scored based on the time required to complete each repetition (2 ties), accuracy (a ruler was used to measure the distance between the two ligatures, with the ideal distance being 1.0 cm) and leakage (the balloon was cut midway between the ligatures and gently pressed on the balloon to uncover any leaks). Additionally, all applicants were surveyed anonymously afterwards using open question formats.

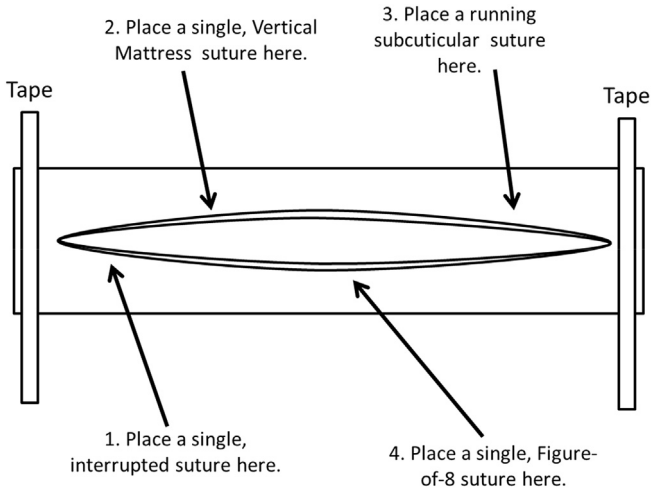

Fig. 1. Suture Station with instructions.

Our main outcomes were objective scores on our Surgical Olympics, In-House Preparation Test (IHPT) and ABSITE® scores for incoming students who were matched through the NRMP to our program. The Surgical Olympics is held twice each year in July and January. Both are identical. It includes a total of 15 different tasks that are completed within 9 separate rooms: some tasks take 2–3 min; others take up to 14 min. The total time for this assessment was 48 min. The tasks include performing an emergent cricothyrotomy, reading a chest –X-rays, interpreting ABGs, placing a chest tube, open knot tying, laparoscopic circle cutting, laparoscopic knot tying, laparoscopic peg transfer, evaluating an ICU patient, inserting a central line, closing fascia, closing skin, anatomy, commenting on videos from real operations and a radiologic imaging exam. All stations were timed and graded live by staff with checklists developed to ensure an objective assessment. An in house preparation test (IHPT) is a 60 question comprehensive multiple choice test created by our surgical faculty. The IHPT is completed in September of the intern year under a time setting (1-h) in hopes of giving trainees a feel for the real 5 h, ~225 question American Board of Surgery In-Training Exam (ABSITE). The ABSITE® is an annual multiple-choice In-Training Examination, designed to measure the progress attained by residents in their knowledge of applied science and management of clinical problems related to surgery.[8]

Table 1
Pre-residency preparatory supplies.

Task	Supplies Provided	Instructional "How To" Videos
Open Knot Tying	Thread X 20	YES
Skin Closure	Needle driver	YES
	Skin forceps	
	Scissors	
	3-0 silk suture X 10	
	Low-cost felt skin model	
Adrenal anatomy	Low-cost felt abdominal anatomy model	YES
CXR interpretation	CXR example, ABCDE method of interpretation	YES
ABG analysis	ABG example, interpretations and explanations	YES

Table 2
Interview Simulation Assessment Set up.

#	Tasks	Descriptions	Instructions
1	Chest X-rays	2 chest X-rays	Applicants were asked to look at 2 chest x-ray, and verbalize as many facts over 30-s period.
2	ABGs	2 ABGs	Applicants were asked to look at an ABG, and verbalize as many facts over a 60-s period.
3	Adrenal anatomy	Red, blue and yellow yarn was used to simulate arteries, veins and nerves, respectively.	Applicants were asked to assemble the anatomical region using the given felt and yarn structures, being careful to name and place structures correctly in relation to other structures.
4	Skin closure	A piece of fabric taped on table	Applicants were asked to perform a single interrupted suture, single vertical mattress suture, single figure of 8 suture and running a 5 cm length subcuticular using a simulated-skin model (Fig. 1)
5	Open Knot tying	A narrow, 28 cm long, filled with 8 cc of red fluid balloon, marked with two lines 1 cm apart (times three) and secured at each end to a container lined with paper towel (Fig. 2)	Applicants were instructed to repeat the task three times with 6 ties total.

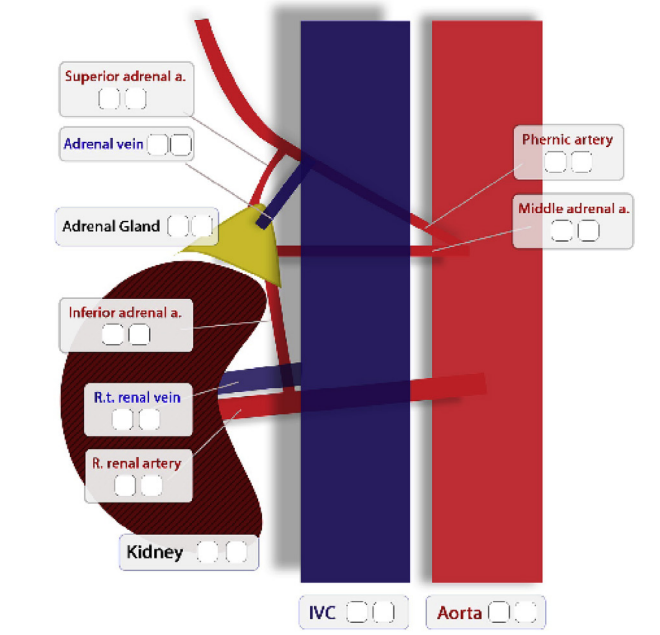

Fig. 2. Adrenal anatomy scoring sheet.

Statistical analysis

All of the task scores from the interview skills assessment were analyzed and reported as median values with IQ. The applicants earned a grade from 1 to 4 points based on how they performed compared to other applicants. Applicants were split into four quartile ranges, the top quartile was awarded 4 points and a point was deducted for each quartile drop. e.g. applicants scored above IQ3 earned 4 points, between median and IQ3 earned 3 points, between IO1 and median earned 2 and less than IQ1 earned 1 point. The total score for each applicant was used in identifying outliers and ultimately influenced the rank list. The interviewees were scored from A-D based on their overall points in the skills assessment; A= >24 points, B+ = 22–24, B = 20–21, C = 18–19, and D=<18.

Table 3
Wound closure scoring.

Date:	Points
Simple	(0–2)
Secure, Skin Edges Touch (2)	
Secure (1)	
Fail (0)	
Vertical Mattress	(0–2)
Secure, Fat Approximated (2)	
Secure (1)	
Fail (0)	
Figure of 8	(0–2)
Secure, Skin Edges Touch (2)	
Secure (1)	
Fail (0)	
SubQ Closure	(0–2)
Secure, Skin Edges Touch (2)	
Secure (1)	
Fail (0)	
Efficiency	
Finished in <6 Minutes	1
Finished With Enough Suture	1
Total	10

Surgical Olympics, IHPT and ABSITE® scores were analyzed for descriptive statistics and reported as mean values with standard deviation (SD) or median values with a range. Statistical analysis was performed to compare the 2018 interns' data with the previous 3 years (2015–2017) interns for the Surgical Olympics and 2 years (2016–2017) interns for IHPT and ABSITE® using the Student's t-test with a significance level set at 0.05.

Results

Sixty medical students received the pre-interview preparatory resources and participated in the 48 min long simulation-based assessment during their interview day. The median (IQR) website views were 7 (4, 11, [0–56]). The median (IQR) score for the ABGs and CXRs (together), adrenal anatomy and skin closure tasks was 7 (6,9,[4–12]), 21 (20,22,[13–21]), 5 (4,6,[3–10]), respectively. For the open knot tying task, the meantime, fastest time, the mean accuracy and leak rates were calculated from the three repetitions (Table 4). The median (IQR) overall scores for all tasks were 21 (19, 24, 15–27). Initially, the applicants were ranked based on the usual interview information such as interview performance, USMLE scores, research experience, etc. Subsequently, the applicants who scored A or B in our skills assessment were moved higher by our PD in our final rank list. Out of the 10 applicants who eventually matched in our program, there were 7 applicants with scores of A, one applicant with a B+, one applicant with a B and one applicant with a C in

Table 4
The median (IQ, range) time and rates of the open knot tying task.

	Median	IQ
The mean time (sec)	35 s	30,42
The best (fastest) time (sec)	22 s	26,32
Accuracy rate %	80%	60%, 93%
Leak rate %	40%	30%, 60%

the simulation portion of the interview.

Among 60 applicants who were surveyed, 37 (62%) responded. Thirty-two (87%) of those applicants felt the information they received prior to their interview date was sufficient, and 100% felt that they had a good sense of what our program has to offer them (Fig. 3). The written feedback is summarized in Table 5.

All 10 interns who matched in our program participated in the 2018 July Surgical Olympics and their scores in thirteen similar stations were compared to the 2015–2017 July Surgical Olympics scores. The 2018 interns' group scored significantly higher than the 2015–2017 interns' group in critical thinking stations such as reading chest x-rays, interpreting ABGs, analyzing ICU facts, naming and locating abdominal anatomy, identifying life-threatening problems, and commenting on surgical videos. In addition, they outperformed the 2015–2017 interns group in laparoscopic PEG transfer skills, inserting a chest tube, and closing the fascia. Table 6 summarizes the mean scores for each station for the 2018 vs 2015–2017 for the July Surgical Olympics scores. There were no significant differences in the pre-ABSITE exam scores (2018 class: 55% (±8%) vs 2016-17 class: 52% (±8%); $p = 0.1$) and the ABSITE exam scores (2018 class: 71.1%tile (±26.6%tile) vs 2016-17 class: 63.4% (±24.2%); $p = 0.43$).

Discussion

This pilot study details several important findings: 1) A simple, low-cost and efficient simulation-based assessment took roughly 192 min to administer to 60 interviewees (48 min per 15 applicants x 4 groups) on a single day. 2) Objective data generated by the hands-on skill tests differentiated applicants. 3) The simulation data was utilized within our larger scoring rubric to rank 4th year medical students. 4) The simulation testing did not seem to negatively impact the perception of our program by interviewees, and applicants appreciated the free surgical resources mailed to them prior to their interview. 5) Early objective data of our current 10

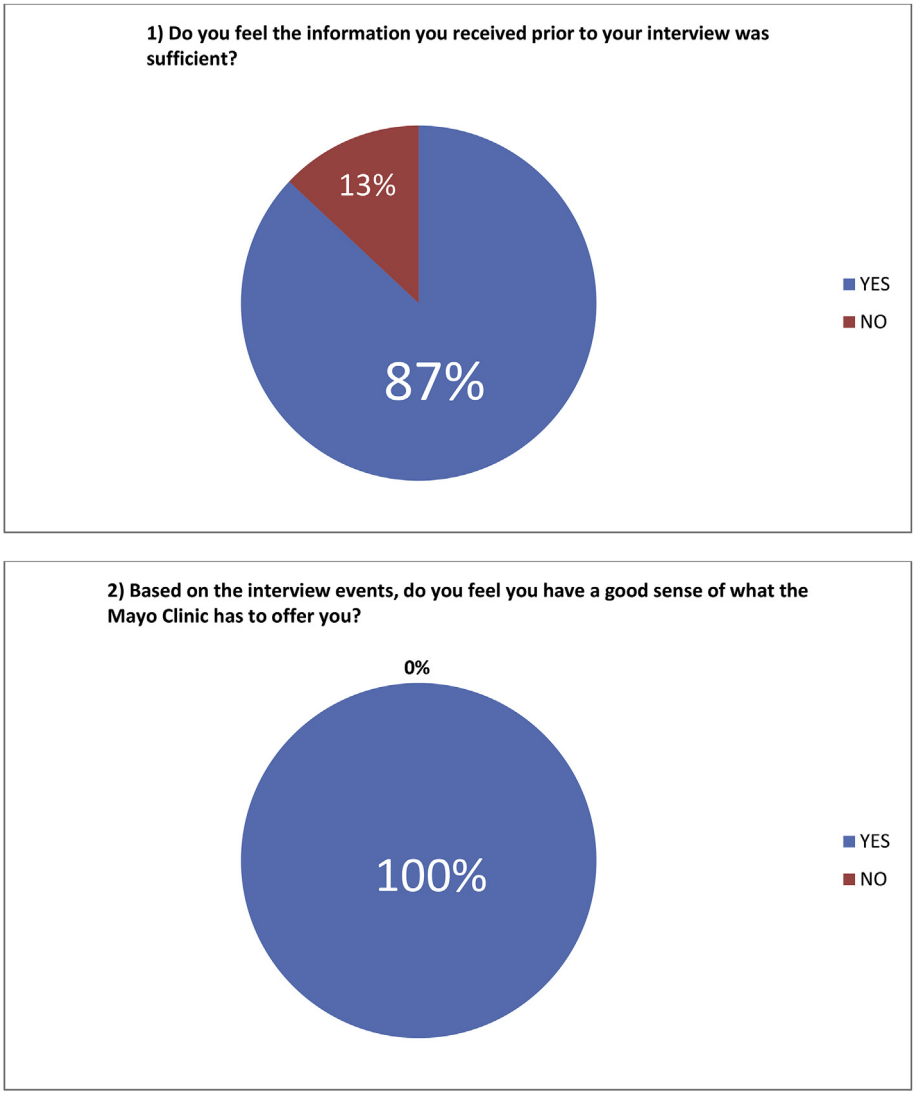

Fig. 3. Survey Results: (37 (62%) out of 60 applicants responded to the survey).

Table 5
Survey Results: Written Feedback.
Please provide feedback regarding the skills assessment activities in the Simulation Center.

Positive feedback	Negative Feedback
Sharing your facilities and resources with us both before and during the interview day reflects really well on the program.	I did not enjoy the skills assessment activities and felt that the day overall would have been much better if certain activities were not recorded and scored.
This was incredibly enjoyable and very different from other interviews in a good way. Felt like I got a sense of what sim lab activities were like.	I would have rather not done it. Nothing wrong with showing off the simulation center but I felt it dragged the day on and wasn't that helpful. To me it seemed its goal was to stress the applicants and see the response. That's ok, just took too long.
I thought the skills assessment was great. I wish we would have had more time there. It was a great place to be able to interact with the residents.	The assessment itself was a little intense since we weren't told that it would be timed. I think it threw me off my game a little to worry about how long I was taking especially for things like x-rays and ABGs.
I thought the simulation center was engaging and pretty fun. It was a nice, low stress environment that I enjoyed.	I think it was too stressful to have things videotaped, timed, and scored for applicants. I would not mind doing the activities, but it felt far too high pressure on an interview day with that type of format.
I thought it was great! It was definitely something unique and I appreciated that not only was I able to participate in the activities but that I was able to interact with more residents as I did so. The residents did a great job at making the assessment low-stress.	But without know how much it favors into the selection process its very nerve racking. For example, if it shares equal weight with the interview. In total for the skills assessment, the idea is great especially if it is designed to see who takes it seriously and prepares I think it's great. But, a little more prior instruction would ease the tension, for example no one had ever taught me the concept of the granny knot to cinch down on the blood vessel until after the skill was over.
Skills lab was a wonderful experience. It definitely made me better. I enjoyed showing my skills off.	I did not like that we were recorded or that we had to sign our names to things. If this exercise was only about showing students what Mayo has to offer, the recordings would be unnecessary. I would also have been okay with the recordings if this was explained to us before the interview day.
The skills lab itself was run very smoothly. Residents were very friendly throughout and provided excellent feedback at their respective stations. I would have liked to see how I did compare to my peers as that would have given me some sense of a barometer as to how I performed. Overall, a great experience.	It was quite stressful. Felt that I underperformed. That may be informative to you though. ABGs were presented in an unusual format.
This was stressful, but I thought it was really good and left me with a sense of what I can do better and how much Mayo cares about my training. The fact that at every station there was time for constructive feedback from residents made this activity not only useful to you all, but also useful to me as an applicant.	
It was great! The imaging/ABG interpretation was tough to do in such a short time. The other stations felt appropriately challenging and left me feeling like I had demonstrated some competence with lots of room to improve. I thought the overall pace was right and didn't feel that I was rushed between stations. Residents and staff were really encouraging and welcoming.	

Table 6
Mean Surgical Olympics scores per station for the 2018 vs 2015–2017 interns.

#	Tasks	2018 (10 interns)	2015–2017 (30 interns)	P value
1	Reading Chest X-ray	8 (1.2)	5.6 (1.9)	0.0003[b]
2	Interpreting ABGs[a]	5.3(1.2)	4.4(1.8)	0.03
3	Performing Cricothyrotomy	3.1(1.2)	2.7(1.2)	0.1
4	FLS* PEG transfer(sec)	119.7(49)	219.6(121.6)	0.01
5	Open knot tying(30 ties _seconds)	92(26)	100.7(35)	0.4
6	Suturing(Max 10 pts)	7.5(2.5)	6.7(2.2)	0.3
7	ICU Knowledge	29.5(9.4)	12(3.4)	<.0001
8	Central Line(Max 10 pts)	5.9(3.8)	6.5(2.6)	0.5
9	Chest Tube(Max 10 pts)	6.3(2)	4.7(2.8)	0.02
10	FLS* Intracorporeal knot tying(sec)	176(68)	192(77)	0.6
11	FLS* Circle cutting(sec)	148(35)	163(52)	0.4
12	Abdominal anatomy(Max 180 pts)	117(23)	80(20)	<0.001
13	Imaging test(Max 30 pts)	18.6(4.4)	16(3.7)	0.03
14	Fascia closure(Max 25 pts)	14.5(2.6)	11.5(2.8)	0.03
15	Video commentary (ref) (Max 200 pts)	60(14)	36(21)	0.001

[a] Arterial Blood Gas.
[b] FLS: Fundamentals of Laparoscopic Skills.

categorical interns suggest they are as good, and potentially better, than our previous interns.

In an attempt to select the best candidates for the program, our program director opted for including a skills test to assess the applicants. The pre-welcome package resources cost approximately $5 (each) and took 5 min to put together into a US Postal Service box. Mailing the package cost $11.67 via USPS 2-day mailing. Our previous efforts,[9,10] tested recently matched residents in March to our program using the "Post Match" welcome package on their technical skills. We concluded that these efforts did eventually help improve our trainees' performance. Moving to include a simulation session for the November interview session was a natural progression and logistically simple. We settled on using only three rooms for skills testing. Each station utilized simple, low-cost materials, and an hour was sufficient for executing the testing session for each of the 20 interviewees. Although the initiative was labor intensive and required a team of workers to build the models and execute during the interview day, if the effort helps select a better "fit" of medical students we felt the cost was worth every penny. Reports suggest the cost of remediation interventions to residency training programs range at a minimum from $3400 to $5300.[4,11,12,22]

During the interview process, our surgical staff, residents, program director and program coordinators look for an array of characteristics to help select our ideal candidates. Anecdotally we have found that at our institution, grit, resiliency, persistence, and insight are crucial factors to success in residency as well as finding candidates that are really motivated to join our program. We believe this session helped us assess and fairly evaluate the surgical skills of the candidates and ultimately assess some level of grit, persistence, resiliency, and insight as well as their motivation to come to our institution. Additionally, this OSCE assessment may have helped some medical students gravitate to our program: all matched candidates clearly received the pre-test and still ranked us in their match list. A minority of interviewees likely did not rank us on their list. Those left on the list may in theory be more motivated to respond or thrive in a culture of educational intensity and simulation opportunities. Traditional screening methodologies have shown inconsistencies in predicting residents' performance using application parameters (i.e., USMLE scores, awards, etc.).[13,14] A study by Farkas et al. tried to find the best candidates for residency using a written examination of medical knowledge.[15] Their assessment was found to be better correlated to future resident ABSITE scores than their past USMLE scores. Gardner et al. also identified the utility of assessing technical skills, not necessarily to evaluate the applicant's technical skills, but to evaluate their capacity for future learning.[16] This is a critical point, and it also allows a PD to see how candidates interact with others (the staff, resident graders, and peers) while they are in a stressful situation. We had four applicants who made it very clear during the exercise that skill simulation was not something they were interested in and it became evident that they were not a good fit for our program. Identifying that information early on is beneficial to both parties.

Whether there are specific interview practices that can be used to predict either future success or negative issues with candidates remains elusive. A 2015 review article by Stephenson-Famy et al. examined 34 residency interview articles that tried to correlate interview score with residency performance.[17] They ultimately found that despite there being a variety of methods introduced, with personality testing, written testing, and clinical skills testing, there was no one single parameter that consistently predicts candidate success in the program. They instead recommended that the interview method be designed to evaluate the specific qualities that the specialty and program are looking for – ideally using multiple variations to clarify and display those candidates attributes.

We believe that our 48 min session in the simulation center allowed us to better assess and evaluate the surgical skills of the candidates. Subsequent improvement over previous intern classes on the objective assessments (Surgical Olympics) we administer each July may, however, stem from a variety of reasons *other than* just being better candidates: the opportunity to practice on the pre-welcome package resources between the interview and match day, more time to watch the online resources and gain comfort with the specific Mayo surgical techniques and expectations for assessment performance, and the added experience of participating in a stressful OSCE examination. Indeed, it is possible we selected trainees that may have more comfort and poise with such testing.

There is unrealized potential of surgical simulation-based training.[18,19] A recent study by de Montburn on PGY-1 residents found that residents who passed the OSATS test at the beginning of their training outperformed those who failed in later years and suggested that technical skills examination can identify and predict performance.[20] Chipman (2009) used OSATS to evaluate basic skills of interns that concluded a simulation curriculum helps interns attain basic surgical skills at levels consistent with PGY-2s & PGY-3s.[21] A preliminary study by Martin et al. suggested that an Objective Structured Assessment of Technical Skills (OSATS) can reliably and validly predict surgical skills.[23] Furthermore, a meta-analysis by Cook et al. and other systematic reviews demonstrated that simulation improved performance in the clinical settings.[24–26] For these reasons, we immerse our PGY-1 residents in a simulation curriculum using 40 Friday mornings each year and assess them biannually. Exposure to simulation tasks early appears to enhance performance later on and using such tasks within an interview setting offers an early opportunity for surgical learners to define their baseline performance.

The use of this simulation station did not eliminate our use of USMLE scores, research experience, letters of recommendation, interviews with staff and residents, and other factors. USMLE scores and shelf exam scores in medical school rotations *are sometimes* good predictors of future academic achievement, but they do not predict clinical performance.[27–30] Therefore, interviews have been used to supplement this lack of insight.[31] The simulation based assessment we offered was used as an adjunct with other parameters in the scoring rubric to ultimately rank candidates. While it did represent no more than 20% of the average candidate's score, it did drop several students far down the list based on their expressed disinterest in engaging with simulation tasks.

Almost all of the applicants visited our website, and all of them were thankful to receive the free surgical tools and resources. Offering medical students additional exposure and experience in surgery is not new. Many medical schools have implemented 3–5 day intensive skills "boot camps" for graduating medical students to help prepare them for residency.[32–34] While these programs are helpful, medical students interested in surgical careers crave surgical experience early on. Most of our applicants liked the skills portion of the interview and engaged with the tasks and sought feedback on their performance; they offered feedback that they enjoyed the challenges offered. However, a few applicants found the simulation tasks intense, stressful, and expressed concern about how it will affect the selection process. Most of the negative feedback focused on having the stations timed and video recorded. Indeed, a study of orthopedic surgery applicants found that their interview was a crucial deciding factor in their match list, suggesting that a bad interview experience could seriously hinder a residency program's match success.[35] We cannot say for certain how this effort altered our match, and the overall success of this process is yet to be determined. However, we did not go any further down our rank list to get our matched applicants than we have in previous years indicating that this simulation event did not adversely affect our ranking in the eyes of our applicants. We continued this initiative for the class of 2019 and hope to follow our interns to graduates and beyond over the next decade to assess whether our rates of attrition, ABS examination pass rates, and other factors have been altered.

Limitations

This study comes with several limitations. Firstly, the use of a pre-interview package and interview day skill assessment is time intensive and requires devoted staff. Logistical concerns are real and low cost resources are needed. Secondly, some interviewees did not feel comfortable with videotaping and voiced concerns through the survey. The criticisms were taken seriously and for our recent 2019 class, we repeated the simulation tasks *without* videotape recording. Thirdly, the interview assessment is similar to our Surgical Olympics test in July and the 2018 matched applicants may have a selection bias that confounds the results – some moved up on the rank list because of their task performance; we might expect them to perform better in the July OSCE. Fourthly, the study hails from one institution interviewing 60 applicants and comparing

subsequent scores of 10 categorical residents with historic controls. Fifthly, a small sample size makes it difficult to determine definitive conclusions from the available data; indeed the newest intern class scored higher in both the pre ABSITE and ABSITE exams, but the differences were not significant. Lastly, it is difficult to evaluate whether candidates did better because they studied, reviewed and practiced the material or simply because of the natural variance of skill within a pool of candidates. Other attributes like optimism, confidence, or performing well under pressure must somehow factor in to our results. Most importantly, the data can in no way truly affirm or deny that the effort was useful in selecting better fitting or better performing trainees to our GS program. There are far too many variables in the selection and match process that ultimately affect how the NRMP puts trainees and institutions together. The ultimate limitation is that we will not know just how good (or bad) our newest class of interns is until they graduate five years later.

Conclusion

The preliminary results of adding a simulation skills event to our one day interview of 60 applicants suggests the effort was useful to our program. While our 2018 surgical interns scored at an all-time high on our July surgical OSCE, we continue to seek additional selection criteria to pair with this simulation effort to help us make better candidate choices – ultimately optimizing the fit for ourselves and our matched interns.

Authorship

Authors YA and NP conceived the study; YA acquired data; YA planned the analysis; and drafted the initial manuscript. All authors were involved in interpreting data and revising the manuscript, and all approved the final manuscript.

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Ethical approval

This study was judged Exempt by the Mayo Institutional Review Board.

Declaration of competing interest

We are not aware of any conflicts of interest.

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