Figure 1A-C. Consensus rankings compared to individual rankings and predicted rankings.

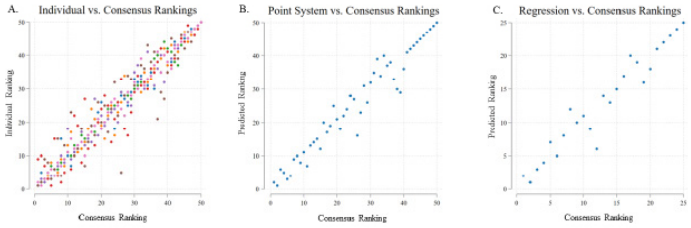

Table 1. Ranking agreement.

	Current Study 2022-2023 SLOE Format			Previous Study 2021-2022 SLOE Format			Difference		
	Consensus: Faculty Ratings	Prediction: Point System	Prediction: Regression	Consensus: Faculty Ratings	Prediction: Point System	Prediction: Regression	Consensus: Faculty Ratings	Prediction: Point System	Prediction: Regression
Exact	22%	24%	32%	21%	12%	20%	1%	12%	12%
Tight	84%	64%	72%	67%	62%	64%	17%	2%	8%
Close	92%	88%	84%	83%	82%	92%	9%	6%	-8%
Loose	97%	92%	92%	93%	90%	96%	4%	2%	-4%
Correlation with consensus	N/A	.97	.97	N/A	.97	.98	N/A	0	-.01

Exact: Percent of rankings where individual/predicted rank is exactly the same as the consensus rank
Tight: Percent of rankings where individual/predicted rank is within ± 4% of consensus rank
Close: Percent of rankings where individual/predicted rank is within ± 8% of consensus rank
Loose: Percent of rankings where individual/predicted rank is within ± 12% of consensus rank

3 Red Light or Green? Did Preference Signals Open Doors for EM applicants in the Match?

Kestrel Reopelle, Erin Hoag, Jonathan Karademos, Peter Tomaselli, Carlos Rodriguez, Dimitri Papanagnou, Jeremiah Ojha

Background: Preference signaling was new in the 2022-23 EM match. While preliminary data has been reported by ERAS, it only includes data extracted from applications. To our knowledge, the literature has not included data collected after the match to examine outcomes related to signaling.

Objective: We hypothesized that all applicants would be more likely to receive interviews at signaled programs (versus non-signaled programs), while competitive applicants would be most likely to match at a signaled program.

Methods: We performed a retrospective cross-sectional study utilizing a convenience sample of applicants who applied to two urban EM residency programs. Applicants were asked to complete a voluntary survey following the 2023 match results.

Results: 427 applicants completed the survey. On average, applicants reported 66.7%(SD 30.9%) of signals resulted in interview invites, compared to 49%(SD 47.3%) for non-signaled programs – a difference of 17.1%(95% CI: 12.1%, 22.1%, p <0.0001). Respondents ranking themselves in the top third of applicants (by perceived competitiveness) received interviews from an average of 79.1%(SD 24.8%) of signaled programs, compared to 59.9%(SD 31.1%) for the middle third and 41.2%(SD 30.4%) for the lower third (table 1)– a significant difference (F =37.5, p <0.0001). 30.3% of the top third group, 41.1% of the middle, and 17.6% of the lower matched a signaled program (table 2)– indicating a relationship between perceived competitiveness and matching a signaled program (X2 =8.57, p =0.014).

Conclusions: Applicants were more likely to receive interviews from signaled programs and perceived competitiveness correlated with interview rates (suggesting some validity in applicant ability to self-assign competitiveness). Applicants who identified as middle third were most likely to match a signaled program. Limitations include retrospective data collection, self-reported data, and the 2023 match climate (i.e., fewer applicants than prior years).

Table 1. Applicant self-assignment by perceived strength of application and percentage of signals sent that resulted in interview invitations.

		Frequency (N = 427)	Percent (100%)	
Perceived competitiveness of applicant:	Top 1/3 of applicants	186	43.6%	
	Middle 1/3 of applicants	189	44.3%	
	Lower 1/3 of applicants	45	10.5%	
	Missing	7	1.6%	
		N	Mean	SD
Percent of signaled programs that turned into interviews for applicants:	Top 1/3 of applicants	178	79.1%	24.8%
	Middle 1/3 of applicants	179	59.9%	31.1%
	Lower 1/3 of applicants	38	41.2%	30.4%

Table 2. Percentage of applicants that matched at a signaled program, categorized by self-reported perceived competitiveness.

Matched with signaled program	Self-reported competitiveness			
	Lower 1/3 of applicants	Middle 1/3 of applicants	Top 1/3 of applicants	Total
Yes	6 (17.6%)	65 (41.1%)	47 (30.3%)	118 (34%)
No	28 (82.4%)	93 (58.9%)	108 (69.7%)	229 (66%)
Total	34 (100%)	158 (100%)	155 (100%)	347 (100%)

4 The Effect of Hospital Boarding on Emergency Medicine Resident Productivity

Peter Moffett, Laura Barrera, Grace Hickam, Scott Huange, Hannah Kissel-Smith, Nathan Lewis, Stephen Miller, Joel Moll, Al Best

Background: Emergency department boarding has escalated to a crisis; impacting patient care, hospital finances, physician burnout, and contributing to error. No prior study has studied the effects of boarding on resident productivity. If boarding reduces productivity, it may have negative educational impacts.

Objectives: We investigate the effect of boarding on resident productivity as measured by patients per hour and hypothesize that increased boarding leads to decreased productivity.

Methods: This was a retrospective observational study at a tertiary urban academic Level I trauma center from 2017 to 2021 with a 3-year emergency medicine residency of 10 to 12 residents per year and annual volumes of 80,000 to 101,000. Boarding was defined as the time between an admission order and the patient leaving the ED. A multivariable mixed model was created with fixed covariates for year, month, day of week, resident experience (total month in residency), shift duration, total daily ED patients, and with residents as repeated measures. The effect of boarding was estimated after covarying out all other factors.

Results: All variables included in the model were significantly associated with changes in productivity (Table 1). Resident experience has the largest effect such that for each month of residency experience, a resident adds 0.012 patients per hour (95%CI 0.010-0.014). Isolating the effect of boarding demonstrated that for every additional 100 hours of boarding, a resident's productivity decreases by 0.022 patients per hour (95%CI 0.016-0.028). In the study the median daily boarding was 261 hours, and if this were eliminated (assuming a resident completes 100, 10-hour shifts annually), a resident could be expected to see 57.4 more patients a year (95%CI 41.8-73.1).

Table 1. Multiple regression results predicting new patients per hour per resident for each variable.

Effect	Estimated New Patients per Hour	Standard Error	95% CI	
Intercept	1.0957	0.0173	1.0616	to 1.1297
Year				
2017	0.1501	0.0122	0.1262	to 0.1740
2018	0.0837	0.0117	0.0606	to 0.1065
2019	[reference]			
2020	-0.0641	0.0137	-0.0909	to -0.0373
2021	-0.1682	0.0156	-0.1987	to -0.1377
Month				
1	0.0635	0.0172	0.0296	to 0.0972
2	0.0776	0.0182	0.0420	to 0.1133
3	0.0496	0.0181	0.0144	to 0.0852
4	0.0840	0.0197	0.0453	to 0.1227
5	0.0750	0.0196	0.0366	to 0.1133
6	0.0585	0.0201	0.0191	to 0.0979
7	-0.0077	0.0219	-0.0507	to 0.0353
8	0.0550	0.0185	0.0188	to 0.0912
9	0.0654	0.0187	0.0288	to 0.1021
10	0.0487	0.0184	0.0127	to 0.0847
11	0.0486	0.0199	0.0095	to 0.0876
12	[reference]			
Day of the Week				
Sunday	0.0587	0.0118	0.0357	to 0.0818
Monday	-0.0312	0.0118	-0.0542	to -0.0082
Tuesday	0.0122	0.0110	-0.0094	to 0.0338
Wednesday	0.1094	0.0123	0.0854	to 0.1334
Thursday	[reference]			
Friday	0.0475	0.0109	0.0261	to 0.0688
Saturday	0.1182	0.0120	0.0946	to 0.1417
Resident months (linear) *	0.0122	0.0010	0.0101	to 0.0142
(quadratic)	-0.0011	0.0000	-0.0012	to -0.0010
(cubic)	0.00003	0.00001	0.00002	to 0.00004
Total Patients Per Day (per 100 patients) *	0.4021	0.0165	0.3697	to 0.4344
Shift duration*	-0.1277	0.0070	-0.1413	to -0.1140
Boarded (per 100 hours) *	-0.0218	0.0032	-0.0280	to -0.0156

The mixed-model also included resident as a repeated-effect with an AR(1) covariance structure.
* Continuous covariates were referenced to the median value. Median resident month=18, total patients per day/100=1.77, shift duration=10 hours, boarded hours/100=2.61

Conclusions: All factors had a significant impact on resident productivity with boarding having a negative impact. Further study is warranted to understand how to mitigate any educational impact.

5 Comparing Scenario-Based Simulation Education to Escape Room Simulation Education with Emergency Medicine Residents

Aubrey Bethel, Sara Dimeo, Vivienne Ng

Background: Gamified education is a modality being incorporated into medical education. Educators have utilized escape room simulation to teach medical concepts in the sim environment by modifying clinical scenarios into clues and activities. No reported study compares the efficacy of escape room simulation (ERS) to scenario-based simulation (SBS) education when teaching medical concepts.

Objectives: We compare SBS to ERS education, hypothesizing that ERS teaches the same medical concepts compared to traditional SBS, while reducing anxiety.

Methods: This is a randomized controlled trial of emergency medicine (EM) residents in a single institution with no exclusion criteria. A peer-reviewed pediatric EM case was modified into a SBS and ERS. Subjects were consented and randomized to the two groups. Primary outcome: acquisition of medical concepts encountered in the sim case, assessed by improvement on a pre- and post-sim quiz. To prevent topic anticipation, the quiz had 15 questions, of which 5 related to the case. Secondary outcome: pre- and post-sim self-reported anxiety levels measured on a 100-point visual analog scale (VAS). Descriptive data and difference of means by two-tailed t test are reported.

Results: 40 residents (of 80 eligible) were enrolled with no loss to follow up. 21 subjects were randomized to SBS and 19 to ERS. Both groups showed improvement on the post-sim quiz, with SBS scores increasing from 73% to 80% (p= 0.016) and ERS from 71% to 79% (p=0.004). There was no statistical difference between the two groups (P=0.665). SBS anxiety levels slightly increased (VAS 50.7 to 52.4) compared to decreased ERS anxiety levels (VAS 52.1 to 31.1), statistically significant at p=0.002.

Conclusions: When comparing SBS to ERS, knowledge acquisition was achieved. Anxiety levels were lower in ERS subjects compared to SBS subjects. Limitations include small sample size and self-report. ERS can teach concepts while improving anxiety in the sim environment.