

**Conclusions:** Recommendations for optimal reading performance for IBL technologies include 14 point font size, Veranda or Arial typeface, font smoothing, positive polarity, increased interletter spacing, and shorter line lengths.

**Table 1.** Summary of design features and learning outcomes.

	Legibility	Reading Time	Reader preference	Mental Workload	Accuracy & Performance
<b>Character size</b>					
Larger size (10-14 pt)	+	+	+	+	+
<b>Typeface</b>					
Veranda	+		+	+	+
Arial	+		+		+
Times New Roman	---		---		---
Courier New		+			
Frutiger	+				
Eurostile	---				
YingHei	+				
Computer Type					o
Kai Type					o
<b>Text Enhancement</b>					
Boldface	+				
Italic	---				
Font Smoothing	+		+	+	
Text Color					o
Text Case					---
<b>Polarity</b>					
*Positive polarity	+		+		+
<b>Text-on-Screen Color</b>					
Blue-on-yellow			+		M
Purple-on-red			---		---
Red-on-white					M
Blue-on-white					M
Green-on-white					M
<b>Brightness</b>					
Increased glare				---	o
Increased luminance					M
<b>Spacing</b>					
Increased interletter		---			+
Increased interword		+			M
<b>Line Length</b>					
Increased line length		+	---		---
<b>Display Type</b>					
RSVP					+
Scrolling		+			
<b>Display Speed</b>					
Increased WPM					M

Legend	
+	Improves
---	Worsens
o	No change
M	Mixed results
N/A	(no data)

\*black text on white background

36 (total months of residency) and then multiplied by the resident’s month of residency, creating an expected number of procedures that a resident should have completed at that specific time. We calculated this number for each of the resident’s 15 core procedures. We termed this the PACE score. Residents can be 1) below the PACE (too few procedures for level of training); 2) at PACE (at the expected number for level of training); or 3) above PACE (exceeding the expected number for level of training). The cumulative resident PACE score spreadsheet was distributed to all the residents. Subsequently, we analyzed the perception of residents on this scoring system. We used a chi-squared test on the proportions along with differences and calculated 95% confidence interval (CI).

**Results:** All 25 residents completed the evaluation, of whom 72% (N=18) were male. One additional resident resided in the PGY3 year. Sixty-eight percent of residents said that the PACE score was more beneficial than a count of procedures, compared to 8% who said it was less beneficial (Difference 60%, 95% CI, 34-76; p<0.0001). Thirty-six percent said that seeing other residents’ PACE scores was motivating, compared to 8% who said it was not motivating (Difference 28%, 95% CI, 5-48; p<0.05). Ninety-six percent of residents said that they were neutral or not offended by having their PACE scores shared with the other residents compared to one resident (4%) who said he or she was “slightly offended” (Difference 92%; 95% CI, 70-97; p<0.0001).

**Conclusion:** Calculating a PACE score is an easy way to track residents’ procedural progress, and it is motivating and well-received by residents.

## 9 A Novel and Well-Received Process for Tracking the ACGME 15 Key Index Procedures

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**Background:** The ACGME has created minimum procedural requirements for graduation. Tracking of these procedures is cumbersome and fraught with inconsistencies. A simplified means for residencies to track procedures is needed.

**Objectives:** We sought to implement a simplified tracking system and determine how residents viewed this Procedural Achievement Count Evaluation (PACE) score to track procedural progress vs a traditional counting method.

**Methods:** The setting was a three-year ACGME-approved residency with 25 residents and an annual census of 96,000. We performed a prospective analysis of a procedural tracking system using residents’ progression. Data were imported from New Innovations into a Google spreadsheet. The total number of procedures required for each procedure was divided by

## 10 Impact of an Emergency Department Resident Sign-Out Checklist on Attending Assessments of Quality

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**Background:** Education and assessment of transition of care during emergency department (ED) shift change constitute essential elements of emergency medicine (EM) training.

**Objectives:** To determine if using a sign-out (SO) checklist (CL) resulted in improvement in the quality of transfer-of-patient responsibilities and impacted the consistency of attendings’ assessments.

**Methods:** Oncoming and departing attending physicians prospectively assessed EM residents’ unstructured morning SO for 38 consecutive days. They then assessed their CL-guided, structured, morning SO over the subsequent 39 days. Assessments included SO duration, SO patient quantity, SO quality visual analog scores (VAS), patient management issues, and oncoming and departing attending interobserver agreement.

**Results:** Oncoming and departing attendings made 548

assessments for non-checklist (NCL) SO and 697 for the CL cohort. Increasing numbers of SO patients correlated with increased SO duration (Pearson  $r = 0.74$ ,  $P < 0.0001$ ). CL did not impact the mean number of SO patients per minute (CL mean  $\pm$  standard deviation [SD] =  $0.86 \pm 0.31$ , NCL mean  $\pm$  SD =  $0.86 \pm 0.23$ ). VAS assessment of SO improved to 8 (range 2.5 to 10;  $P < 0.0001$ ) for CL compared to 7.5 (0.5 - 0.95) for NCL. Important aspects of SO improved with implementation of CL (see Table): tasks, disposition, and necessity of attending clarification. Overall, comparison of oncoming and departing attending physician global assessment SO scores manifested low interobserver agreement (intraclass correlation coefficient = 0.39; 95% confidence interval, CI -0.26 to 0.70). Oncoming and departing attendings perceived significantly improved SO global VAS assessments for the CL cohort (CL mean  $\pm$  SD =  $8.3 \pm 0.55$ ; NCL mean  $\pm$  SD =  $7.0 \pm 1.2$ ;  $P < 0.0001$  and CL mean  $\pm$  SD =  $7.6 \pm 1.1$ ; NCL mean  $\pm$  SD =  $7.0 \pm 1.1$ ;  $P = 0.05$ , respectively).

**Conclusion:** Although assessments demonstrated inconsistent interobserver agreement, CL utilization improved oncoming and departing attendings' perceptions of residents' SO quality compared to unstructured SO.

**Table.** Impact of checklist on sign-out (SO) quality.

	No-Checklist	Checklist	P value
Total N	548	697	
Total Attending Assessment of SO Quality VAS (10 cm range)	7.5 (0.5 - 9.5)	8.0 (2.5 - 10)	< 0.0001
Oncoming Attending Assessment of SO Quality VAS $\pm$ SD	7 $\pm$ 1.2	8.3 $\pm$ 0.6	< 0.0001
Departing Attending Assessment of SO Quality VAS $\pm$ SD	7 $\pm$ 1.1	7.6 $\pm$ 1.1	= 0.05
+ Diagnosis	1 (714/727, 98.2%)	1 (522/527, 99.1%)	= 0.1
- Diagnosis	12/727, 1.7%	5/527, 0.9%	
+ "Task"	578/686, 84.3%	482/493, 97.8%	< 0.0001
- "Task"	60/686, 8.7%	8/493, 1.6%	
+ Disposition	683/703, 97.2%	518/521, 99.4%	< 0.004
- Disposition	14/703, 2%	3/521, .6%	
+ Admit Team	392/584, 67.1%	321/421, 76.2%	< 0.03
- Admit Team	83/584, 14.2%	35/421, 8.3%	
+ Code Status	45/505, 8.9%	52/357, 14.6%	= 0.13
- Code Status	295/505, 58.4%	187/357, 52.4%	
+ Attending Add	100/427, 23.4%	39/345, 11.3%	< 0.0001
- Attending Add	327/427, 76.6%	306/345, 88.7%	

VAS, visual analog scores; SD, standard deviation; cm, centimeters.

## 11 Retrospective Review of Third-Year Medical Students' Clinical Evaluations via Entrustable Professional Activities

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**Background:** Emergency medicine (EM) is not a required third-year (M3) clinical clerkship for medical schools per Liaison Committee on Medical Education accreditation

standards. National Board of Medical Examiners (NBME) subject exams in other core clerkships suggest students' medical knowledge improves with increased clinical exposure. Consequently, no M3 EM-specific grading tool exists for this student cohort. At our institution, Entrustable Professional Activities (EPA) have been adopted for M3 clerkship evaluations, yet have not been longitudinally studied in relation to EM student performance.

**Objectives:** In absence of an M3 NBME exam to assess EM learners' development, this study reviewed M3 EPAs over one academic year. We hypothesized that EPA scores would improve temporally as students gained more clinical experience.

**Methods:** This was an observational, retrospective review of 123 students rotating in three EM clerkship blocks from July 2017–June 2018 at the University of Kentucky. Standardized EPA scoring on a scale of 1-4 (graded 65%, 75%, 85%, and 95% respectively) for differential diagnosis, diagnostic plan, and oral presentation were reviewed for every patient encounter-based faculty evaluation. Faculty and students were instructed on grading criteria prior to clerkship.

**Results:** Of 2917 total EPA scores reviewed, 81 did not receive grades and were excluded from analysis. One EPA was excluded due to an absent faculty signature. We analyzed the remaining 2835 EPAs by rotation block. Statistically significant differences were found for all assessment categories and overall average scores. The mean differential diagnosis scores for rotations 1-3 were 3.11, 3.13 and 3.25, respectively.

**Conclusion:** Our results suggest that overall student clinical EPA evaluations increased over time during the M3 year as well as within the individual categories of differential diagnosis, diagnostic plan, and oral presentation. Further study is needed to identify comparability at other institutions as well as the influence of M3 clerkship experiences prior to the EM rotation.

## 12 Impact of Ambient Background Noise on Sign-Out in the Emergency Department

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**Background:** Elevated emergency department (ED) noise levels can impact physician communication during physician sign-out (SO).

**Objectives:** To assess the impact that time of day, background music, background discussion, and SO have on ambient noise in an emergency department's physician charting area.

**Methods:** This prospective observational study monitored ambient noise levels in an emergency physician charting area