nursing faculty. The learners work through a case requiring participation from all professionals to prevent a patient safety error. At closing, all learners complete an online survey rating self-efficacy pre and post activity. Facilitators attend a debrief to share experiences and provide feedback.

Results: 335/340 students completed the survey. All 8 objectives were statistically significant ($p < .001$) when analyzed using a Wilcoxon Signed-Rank test. Effect sizes were calculated to determine the magnitude of the increase. The highest effective size was 0.54 for the item, "I was able to recognize how others' skills and knowledge complement and overlap my own" and the lowest was 0.46 for, "I was able to include the patient/family in decision making." Typically, values in the range of 0.4 to 0.6 are considered moderate effect size, which is appropriate to the length of this intervention.

Conclusions: Using multi-modal measures to collect feedback from both learners and facilitators maintains academic integrity and can move the needle from good to great.

53 Utility of Amazon-Inspired Algorithm for Resident Procedure Logging

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Background: Accurate procedure logs allow residents to demonstrate procedural competence and meet accreditation requirements. Residents often perform multiple procedures on the same patient but may only remember to log a single primary procedure. To mitigate this, Henry Ford Hospital Emergency Medicine (HFHEM) developed two logging tools that recommend additional procedures to record when a primary procedure is submitted. The first tool ("Website") provides suggested procedures based on a static linkage list predetermined by residency leadership. The second ("App") uses an Amazon-inspired algorithm to provide dynamic suggestions based on selection patterns of other residents. For example, the App would say "Residents who logged I&D frequently logged Local Anesthesia or Ultrasound" (Figure 1).

Objectives: To determine whether the dynamic algorithm leads to a greater frequency of procedure co-logging compared to the static linkage list. Secondarily, to determine whether such suggestions successfully prompt residents to log procedures which they may have otherwise forgotten when using traditional logging tools. To develop an innovative tool that would reduce the effort required by residents to log their procedures. To develop an algorithm that would improve the accuracy of the procedure record by capturing procedures that would potentially be forgotten if traditional logging tools were to be used.

Methods: Procedure logging data at HFHEM for academic year 2018-2019 were retrospectively analyzed. The rates at which residents co-logged 1, 2, or ≥3 procedures using the Website or the App were compared.

Results: 8,656 entries were logged: Website 6,804 (78.6%) and App 1,852 (21.4%). The App was superior to the Website in promoting procedure co-logging (Table 1). Overall, 34.8% of submissions had at least 2 procedures co-logged.

Conclusions: The Amazon-inspired algorithm improved procedure co-logging when compared to the residency leadership generated static list. Suggesting procedures (regardless of the algorithm used) led to a high rate of co-logging. This innovative algorithm may decrease the time needed to log procedures and may improve the accuracy of the record by capturing procedures potentially forgotten when using traditional logging tools.

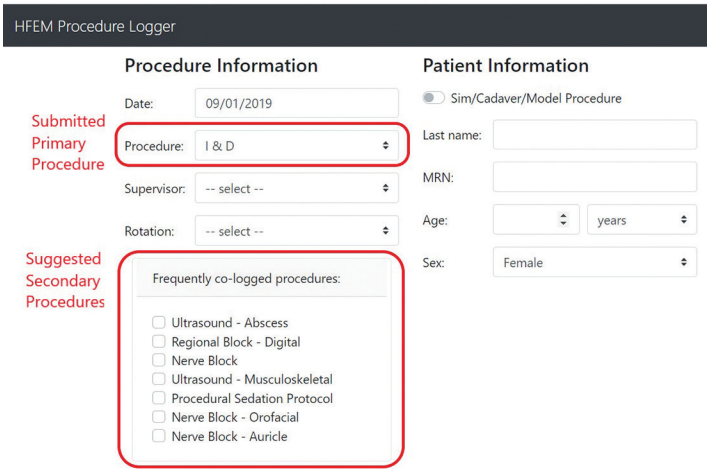

Figure 1. Procedure logging app example.

Table 1. Primary results.

Number of co-logged procedures	Website	App	p-value
1	4687 (68.9%)	957 (51.7%)	<0.001
2	1237 (18.2%)	588 (31.8%)	
≥3	880 (12.9%)	307 (16.6%)	
1	4687 (68.9%)	957 (51.7%)	<0.001
>1	2117 (31.1%)	895 (48.3%)	
1 or 2	5924 (87.1%)	1545 (83.4%)	<0.001
≥3	880 (12.9%)	307 (16.6%)	

54 Validity Evidence for the Core Physical Examination in Medical Students

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Background: The Core Physical Exam (CPE) has been proposed as a basis for the Core + Cluster curriculum for teaching and assessing physical examination (PE) skills in medical students.

Objective: This study provides initial validity evidence for a modified, institution-specific CPE as an assessment of

PE skills in medical students. Validity investigation is the process of collecting and interpreting evidence to support decisions about assessments. Using conceptual frameworks for validity evidence, specific evidence for content, response process, internal structure, relationship to other variables and consequences was gathered.

Methods: The University of Colorado School of Medicine (UCSOM) CPE was developed as a 25-item version of the published CPE. Validity evidence for the UCSOM CPE was gathered using data from two classes of approximately 180 medical students from to September 2015 to December 2018. Validity evidence specific to content, response process, internal structure, relationship to other variables and consequences was gathered.

Results: Content and response process evidence was based on expert content expert of the UCSOM CPE and extensive rater training at the clinical performance center. High overall means of PE performance across the assessments suggest that students are able to perform recently learned PE skills in a clinical performance center assessment. (Table 1) Correlations of performance on the UCSOM CPE to other assessments of PE competence were generally low in the range of 0.14 to 0.23, consistent with correlations between stations of objective structured clinical examinations. (Table 2) The overall phi coefficient for the G study of 0.258 suggests low reliability for a single assessment. As the 90% pass-fail cut point determined by a modified Angoff approach resulted in a fail rate of 10% to 13% for the UCSOM CPE in first year and 36% to 38% in second year, clinical skills course directors selected a 80% pass-fail cut point as a defensible threshold for the UCSOM CPE for entry into supervised clinical practice.

Conclusion: Initial validity evidence supports the use of UCSOM CPE as a useful educational strategy for teaching physical examination and as a formative assessment of PE competence in medical students.

Table 1. Summary of UCSDM Clinical Skills Assessments Detailing Number of Core and Non-Core Physical Examination Items.

Sequence of Assess-ments	Exam Content	# UCSOM CPE Items	# Additional PE Items	Mean (SD)	
				Class of 2019	Class of 2020
M1-Fall: Systems*	Cluster 1			**92.5 (5.4)**	**89.9 (5.2)**
	- Head and Neck	6	14		
	- Pulmonary	4	8		
	- Upper Musculoskeletal	1	16		
	Total	**11**	**38**		
	Cluster 2				
	- Abdominal	4	10		
	- Cardiovascular	7	6		
	- Lower Musculoskeletal	1	18		
	Total	**12**	**34**		
M1-Spring: CPE	Comprehensive Medical Encounter: UCSOM CPE items only[a]	**25**	**0**	**94.8 (5.6)**	**95.7 (4.8)**
M2-Fall: Neuro	Focused Medical Encounter: Neurologic Body System PE items only[a]	**0**	**15**	**95.6 (4.6)**	**91.4 (7.5)**
M2-Spring: CPE	Comprehensive Medical Encounter: UCSOM CPE items only; additional abdominal PE items not included in analysis[a]	**25**	**0**	**90.3 (7.5)**	**91.2 (7.9)**
M3-Spring:[b] OSCE	Ten Focused Medical Encounters: Various UCSOM PE items and Additional Items	**13**	**16**	**68.1 (9.1)**	**Not available**

Notes:
* Students are tested on either Cluster 1 or Cluster 2 (3 out of 6 body systems) for the M1 Fall Systems assessment.
[a] Same for classes of 2019 and 2020
[b] Data available for Class of 2019 only

Table 2. Relationships to Other Variables: Spearman Correlations Between Assessments for the Physical Examination Assessments by Class.

Class of 2019	M1-Fall: Systems	M1-Spring: CPE	M2-Fall: Neuro	M2-Spring: CPE
M1-Fall: Systems N=182				
M1-Spring: CPE N=181	0.14 P=.05 179			
M2-Fall: Neuro N=181	0.16 P=.03 179	0.08 P=.28 179		
M2-Spring: CPE N=180	0.20 P<.01 175	.13 P=.08 176	0.20 P<.01 177	
M3-Spring: OSCE N=173	0.20 P=.02 150	0.22 P<.01 150	0.08 P=.31 150	0.08 P=.40 147
Class of 2020	M1-Fall: Systems	M1-Spring: CPE	M2-Fall: Neuro	
M1-Fall: Systems N=184				
M1-Spring: CPE N=183	0.14 P=.05 183			
M2-Fall: Neuro N=184	0.12 P=.11 183	0.18 P=.06 183		
M2-Spring: CPE N=184	0.16 P=.03 183	.23 P<.01 183	0.34 P<.01 184	

Note: Associated p values and numbers of students included in the correlations are included below the correlation.