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Identifying Gaps in Ultrasound Education and Potential for a Digital Curriculum

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Objectives: With the restrictions placed on medical students on their return to the clinical learning environment, we anticipate that their experience would differ from students in the prior year. Specifically, we hypothesize that students would see fewer patients with respiratory or infectious symptoms as their presenting complaint.

Methods: Through a query of the electronic medical record, we obtained de-identified information for all patients seen in the Emergency Department at our large academic medical center for June 1 – October 31 in 2019 and 2020, including age, chief complaint, and if the patient was seen by a medical student. Investigators categorized chief complaints into one of twelve categories and calculated the total number of student shifts during the study time period using the published student schedule. We calculated the average number of patients seen by students in each category per shift for 2019 and 2020.

Results: In 2020, students saw on average fewer patients with respiratory, constitutional, and cardiac presenting complaints per shift. Students saw slightly fewer patients per shift overall in 2020 in comparison to 2019.

Conclusions: Restrictions placed on medical students in the Emergency Department during the COVID-19 pandemic have had a significant impact the student clinical experience during their clerkships. Although the intent of these restrictions was to protect learners from the risks posed by caring for COVID patients, these restrictions had unintended consequences on which patients students evaluated.

Table 1.

Chief Complaint Category	2019 Patients per student shift	2020 Patients per student shift
Cardiovascular	0.51	0.40
Constitutional	0.57	0.35
Endocrine	0.05	0.05
Gastrointestinal	0.78	0.76
Genitourinary	0.17	0.18
Integumentary	0.18	0.18
Musculoskeletal	0.56	0.56
Neurologic	0.38	0.34
Psychiatric	0.13	0.14
Other	0.43	0.41
Respiratory	0.45	0.17
Trauma	0.66	0.67
Total	4.85	4.2

32 Identifying Gaps in Ultrasound Education and Potential for a Digital Curriculum

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Learning Objective: Attendees will learn about how development of a digital ultrasound curriculum can be used to address knowledge gaps in resident education and is associated with improved confidence with performing and interpreting ultrasound exams.

Background: Ultrasound is a key competency for EM residents and has numerous applications. It is not clear if residents gain sufficient experience with less frequently used ultrasound exam types through traditional teaching methods. A digital curriculum may provide additional learning opportunities and help to address these knowledge gaps.

Objectives: The primary goal was to identify current gaps in resident ultrasound education by assessing confidence in performing and interpreting various U/S studies. A secondary goal was to determine if a digital ultrasound curriculum was feasible.

Methods: This prospective observational study was performed at a 3-year EM residency program located at a level 1 trauma center in a large metropolitan area. A pre-implementation survey evaluated resident utilization and confidence with various U/S exams using multiple choice and Likert scale questions. After implementation of a digital ultrasound curriculum, which included monthly cases and self-paced modules, a post-implementation survey was conducted.

Results: There were 12 and 18 respondents in the pre and post implementation surveys respectively. In both surveys, FAST and cardiac exams had the highest confidence and utilization scores. Ocular, pelvic, DVT, and renal U/S had low pre-implementation confidence and utilization scores that increased significantly on post implementation surveys (Figures 1 and 2). Initially, PGY3's used U/S most frequently but post-implementation PGY2's had the highest overall usage. Overall, the digital curriculum post-implementation survey showed an 88% increase in interpretation confidence score and a 28% increase in utilization.

Conclusions: Confidence with performing and interpreting various ultrasound exams was low for infrequently used exam types and increased significantly following the implementation of a digital curriculum. These are feasible interventions and could improve knowledge of less commonly used exams.

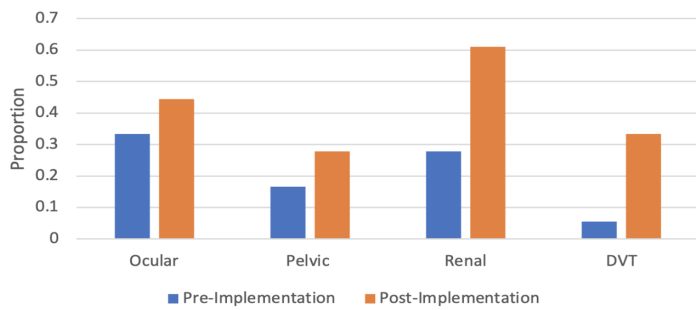


Figure 1. The proportion of residents reporting confidence with performing the least commonly used U/S exam types.

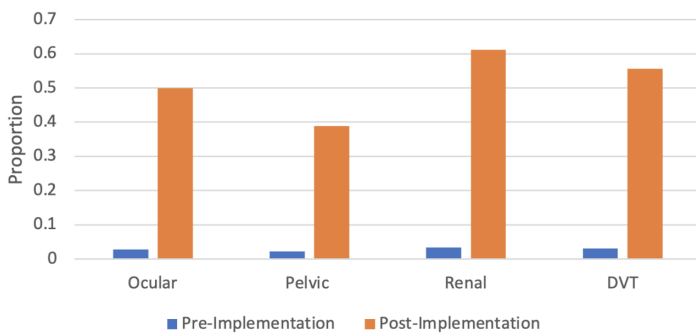


Figure 2. The proportion of residents reporting confidence with interpreting the least commonly used types.

department (ED) to determine patient presentations where the tool would be most valuable.

Methods: We performed a prospective observational study of usage of a DDx tool in an academic ED. The tool was evaluated in the high-acuity area of the ED in patients requiring immediate evaluation. A resuscitation resident rotates each month in the area and evaluates each patient. The resident queried the DDx tool on the patient’s symptoms and completed a data collection tool. Data was summarized by frequencies for use in DDx creation with attention to body system categories. Chi-squared or Fisher’s exact tests were employed on comparison.

Results: The DDx tool was used for 98 patients, of whom 60.2% were female and 7% were pediatric. The tool was not used for 87 patients seen by the resident. Compared with non-DDx tool use, the DDx tool was used significantly for more patients with gastroenterology (GI), infectious disease (ID), metabolic/renal, and neuropsych complaints, and significantly less for trauma patients (Table 1).

Conclusions: A DDx tool has potential to enhance DDx generation in the resuscitation setting for EM residents, particularly for assessing patients with chief complaints consisting of GI, ID, metabolic/renal, and neuropsych involvement. It has less utility for trauma diagnosis, likely because trauma protocols follow strict, stepwise management.

33 Emergency Medicine Resident Use of a Differential Diagnosis Generator for Critical Patients in the Emergency Department

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Learning Objective: We aimed to evaluate the use of a differential diagnosis tool by emergency medicine residents in the critical care area of an emergency department to determine patient presentations where the tool would be most valuable and widely used.

Background: Generating a differential diagnosis (DDx) is a vital skill for emergency medicine (EM) residents to develop in their care of critically ill patients. Electronic DDx tools allow a physician DDx to be cross-checked with artificial intelligence to broaden the DDx in complex cases, and may assist in resident DDx generation. Currently, DDx tools have not been well studied in EM high-acuity scenarios. It is unclear which patient presentations challenge EM residents most in their DDx generation.

Objective: We aimed to evaluate the use of a DDx tool by EM residents in the critical care area of an emergency

Table 1. Chief complaints and DDx tool use.

Chief Complaint	Number of cases with each symptom complex	DDx tool used (n=98)	DDx tool not used (n=87)	p value
Gastroenterology	15	12	3	0.03
Hematology/Oncology	5	3	2	1.00
Infectious Disease/Immunologic	10	9	1	0.02
Toxicology	4	1	3	0.34
Allergic Reactions	5	1	4	0.19
Cardiology	49	25	24	0.87
Dermatology	1	0	1	0.47
Metabolic/Renal	17	14	3	0.01
Musculoskeletal	2	2	0	0.50
Neuropsychiatric	41	29	12	0.01
Reproductive	7	5	2	0.45
Respiratory	27	19	8	0.05
Surgical	1	0	1	0.47
Trauma	36	7	29	<0.001