Title

(O-F6) A Mixed-methods Study of Barriers and Facilitators to Point-of-care Ultrasound Implementation for Emergency Department Providers at the Durham Veterans Affairs Healthcare System

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7 (O-I5) Factors Associated with Conversion to In-person Visit Among Patients Presenting for Pediatric Telehealth Encounters

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Oral Presenter: C. Anthoney Lim, MD MS

Objectives: To identify patient- and illness-related factors associated with conversion to in-person visits among children presenting for pediatric telehealth encounters.

Background: Increases in telehealth utilization during the COVID-19 pandemic have been driven by limited availability of office visits due to infection prevention guidelines, parental hesitancy to enter healthcare facilities, and parity in reimbursement for providers. Due to increased demand and limited number of telehealth providers, it is important to determine which children may benefit the most from these encounters.

Methods: In this retrospective case-control study, patients 0-21 years old presenting for a telehealth encounter were evaluated. Children who had an in-person visit within seven days of the telehealth visit were identified as conversion cases and matched in a 1:3 ratio to controls by age in months up to 36 months and by year for those 4 and older. Patient demographics, past medical history, symptoms, and diagnoses were collected. A multivariable logistic regression model was developed including variables significantly associated with conversion on univariate analysis.

Results: From March–April 2020, there were 2,465 pediatric telehealth encounters. Of these, there were 67 (3%) conversions to in-person visits. 79% of these conversions originated from general pediatric telehealth encounters and the remaining from subspecialty telehealth visits. 69% of these conversions were to the ED and 31% in the clinic. Median days to in-person visit was 2 (1, 5). Median age was 25 months (1, 172), 66% were female, and 43% had a chronic medical condition. 55% were uninsured or on Medicaid, and the remaining were commercially insured. The most common symptoms reported included 42% respiratory, 22% fever, 19% pain, 18% vomiting/diarrhea, and 18% rash. After matching with controls based on age, a multivariable logistic regression model revealed that a history of cancer (OR 15.8, 95% CI 1.3-195.0), emesis (OR 4.6, 95% CI 1.1-18.9), pain (OR 4.5, 95% CI 1.5-13.3), non-COVID-19 related respiratory symptoms (OR 3.9, 95% CI 1.5-9.7), and telehealth visit with a specialist in allergy, endocrinology, gastroenterology, or pulmonary (OR 0.3, 95% CI 0.1-0.7) were associated with conversion, with an AUC of 0.82.

Conclusion: This introductory evaluation may suggest that certain patient- and illness-related factors are associated with telehealth conversion to in-person encounters. To appropriately allocate telehealth and ambulatory resources, further study will determine whether some children will benefit if they are triaged directly to in-person visits.

8 (O-F6) A Mixed-methods Study of Barriers and Facilitators to Point-of-care Ultrasound Implementation for Emergency Department Providers at the Durham Veterans Affairs Healthcare System

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Oral Presenter: Rebecca G. Theophanous, MD, MHSc

Objectives: Our primary objective was to identify the facilitators and barriers to optimize our program implementation using the Consolidated Framework for Implementation Research (CFIR) and test for impact at a single local emergency department (ED).

Background: Emergency ultrasound program leaders nationwide recognize that point-of-care ultrasound (POCUS) knowledge retention and utilization are difficult to achieve. Prior studies have identified a lack of provider training with a gap in POCUS knowledge and skills, lack of credentialed ultrasound users, and lack of quality assurance image review as significant barriers to POCUS use. A standardized approach to identifying and addressing barriers to sustainable POCUS implementation is needed to increase POCUS use, reduce radiology ultrasound, and potentially improve ED flow.

Methods: Our mixed-methods study implemented a co-designed, multifaceted intervention at the Durham Veterans Affairs ED from November 2021–October 2022 (12 months) to enhance POCUS usability and sustainability, including education, equipment knowledge, quality review process, and image archiving in the health record. Furthermore, 20/25 (80%) full-time ED providers participated in small- or large-group hands-on educational POCUS training sessions between February–May 2022. We conducted 14 semi-structured interviews to identify emergent themes and codes on ED POCUS use and performed team-based coding using inductive and then deductive analysis using NVivo. For our impact evaluation, we assessed POCUS program acceptability, effectiveness, and feasibility via provider pre/post-course questionnaires, interviews, and health record data (ED POCUS, radiology ultrasound orders, and ED length of stay (LOS).

Results: Five POCUS themes emerged: convenience and

efficiency; ED environment (space and place); opinions on ED clinical POCUS use and education; and peer influences, feedback, and teaching. POCUS facilitators include machine availability, resident teaching, ED procedural POCUS, hands-on group training, colleagues' contagiousness and enthusiasm, and ultrasound faculty support and guidance. Additionally, ED and hospital leadership support and hospital-wide POCUS collaboration were cited as essential for success. POCUS barriers were time constraints, alternative radiology imaging availability, POCUS knowledge and skills comfort, and eliminating unnecessary and cumbersome steps for image acquisition and documentation/storage. Additional identified needs (image review, faculty credentialing, and an archiving system), require development locally to strengthen provider skills and reduce duplicated radiology studies. For feasibility and effectiveness, we found no significant change in ED LOS (6.7à7.5 hours, P=0.0849) and radiology ultrasounds ordered (355à361, P=0.417) but a significant increase in ED POCUS (72à267 scans, P<0.001), in the six months pre/post-intervention. The most frequently performed POCUS scans were cardiac, deep vein thrombosis (DVT), soft tissue, musculoskeletal, and biliary, and radiology studies were DVT, biliary, and scrotal ultrasound. From pre/post-intervention survey data, overall comfort with performing and teaching diagnostic and procedural POCUS changed minimally. All respondents agreed that POCUS is a useful clinical tool and that residents should learn POCUS, supporting acceptability.

Conclusion: We identified the barriers and facilitators to sustained POCUS training and implementation using the CFIR framework. Our POCUS program is acceptable, effective, and feasible based on survey responses, interviews, and health record data. Future work should address POCUS barriers and incorporate facilitators by tailoring POCUS education and clinical use toward individual providers at each site, using momentum from positive peer feedback, selecting an "ED clinical champion," and integrating ED and hospital leadership support, with the goal to extend our implementation evaluation into a standardized national scale intervention.

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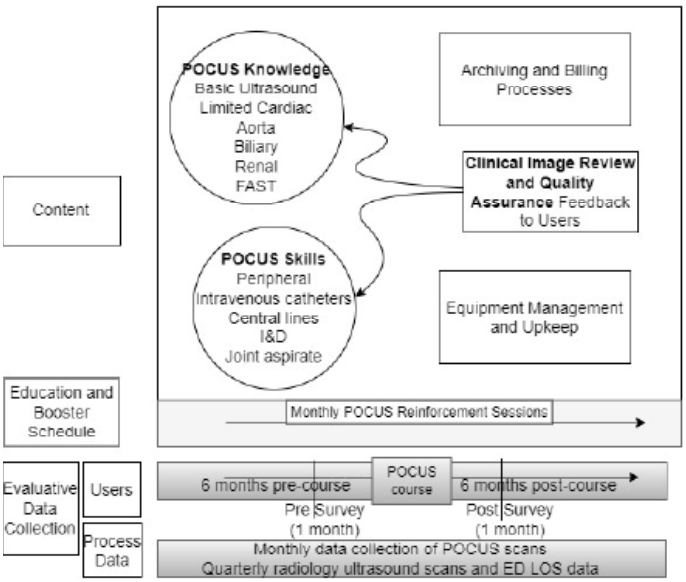

Figure 1.VA POCUS implementation plan-study timeline

Table 1. Identified themes and codes and respective barriers and facilitators as stratified by the Consolidated Framework for Implementation Research (CFIR)

CFIR construct: Individuals (number of participants)
Themes: Convenience and efficiency, opinions on clinical POCUS use, opinions on POCUS education
• **Barriers:**
• **Time constraints based on clinical volume (14/14)**
• **Comfort level with background POCUS knowledge and skills (14/14)**
• **Eliminating unnecessary and cumbersome steps for image acquisition and documentation/storage (11/14)**
• **Facilitators:**
• **Excellent image quality and ease of US machine use (14/14)**
• **Producing differentials and diagnoses; answering pointed clinical questions or progression of specific diseases (11/14)**
• **Provider clinical improvements and useful POCUS exams (10/14)**
• **Ensuring patient safety (7/14)**
• **Clinical standard of care (10/14)**
• **Patient-centered care improvements with increased efficiency and satisfaction (8/14)**
• **Hands-on POCUS group training rather than didactic learning (14/14)**
• **Both:**
• **US machine usability and familiarity (14/14)**
• **Ease of documentation (Barrier 4/14; Facilitator 8/14)**
• **Desire for more practice and repetition (13/14)**
• **Individuals' comfort with POCUS image acquisition and interpretation (Barrier 8/14; Facilitator 5/14)**
• **Different teaching and learning styles for POCUS education: preferred hands-on, small group training over classroom didactics (14/14); human models (5/14); simulation (6/14)**
CFIR constructs Inner setting (Themes: ED environment and peer influences/feedback/teaching)
• **Barriers:**
• **Availability of alternative radiology imaging modalities (11/14)**
• **Location and cleanliness at other sites (but not a problem at the Durham VA) (12/14)**
• **Facilitators:**
• **Availability of US machines and resources, cleanliness, and maintenance (14/14)**
• **US learners and resident teaching (14/14)**
• **POCUS use for ED procedures (14/14)**
• **Existence of a POCUS archiving system and faculty credentialing system (12/14; 14/14)**

Table 2. Durham VA Healthcare System Emergency Department POCUS scans, pre/post-course

	Pre-course POCUS scans (6 months)		Post-course POCUS scans (6 months)	
	Q4 (November 1, 2021 - January 31, 2022)	Q1 (February 1, 2022 - April 30, 2022)	Q3 (May 1, 2022 - July 31, 2022)	Q4 (August 1, 2022 - October 31, 2022)
Types of ED POCUS scans performed	0 cardiac	14 cardiac	25 cardiac	39 cardiac
	2 DVT	0 DVT	10 DVT	14 DVT
	0 renal	1 renal	2 renal	14 renal
	2 bladder volume	1 bladder volume	9 bladder volume	14 bladder volume
	2 biliary	4 biliary	9 biliary	12 biliary
	1 IVCFT	0 IVCFT	2 IVCFT	8 IVCFT
	9 lung	0 lung	9 lung	21 lung
	2 soft tissue	1 soft tissue	9 soft tissue	22 soft tissue
	0 aorta	1 aorta	2 aorta	4 aorta
	0 RUSH	0 RUSH (4 tandem)	0 RUSH	13 RUSH
	1 cardiac-concomitant	1 cardiac-concomitant	9 cardiac	2 cardiac
	0 ob/gyn	1 ob/gyn	2 ob/gyn	3 ob/gyn
	2 ocular	1 ocular	1 ocular	3 ocular
	0 liver	1 liver	9 abdomen (GBC)	1 liver
	1 vascular?	1 vascular/femoral artery		1 fistula
Monthly ED POCUS scans performed	0 US - November 2021		41 US - May 2022	
	0 US - December 2021		11 US - June 2022	
	10 US - January 2022		29 US - July 2022	
	3 US - February 2022		20 US - August 2022	
	91 US - March 2022		85 US - Sept 2022	
	10 US - April 2022		69 US - Oct 2022	
Total ED POCUS scans performed	72 total POCUS scans in 6 months pre-course (Nov 1, 2021 to April 30, 2022)		267 total POCUS scans in 6 months post-course (May 1, 2022 to Oct 31, 2022)	

9 (O-K4) Two-year Results from a New Model Pain Coach Educator Program and Integrative Discharge Toolkit for Pain Management in an Urban US Teaching Hospital and Emergency Department During COVID-19 Pandemic

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Oral Presenter: Phyllis L. Hendry, MD

Objectives: To describe the two-year implementation pilot and descriptive analysis of a novel emergency department (ED) pain coach educator program including a customized integrative patient pain toolkit for use at home, including patient demographics, pain characteristics, coaching and toolkit topics, implementation challenges, and one-month patient feedback and toolkit utilization survey.

Background: Pain is the most common presenting ED complaint, yet most emergency care professionals receive minimal education about nonpharmacologic, integrative pain management options. It is faster to administer or prescribe medications than to provide patient education and nonpharmacologic, nonopioid modalities. The US and other countries are dealing with opioid epidemics resulting in a renewed focus on pain education and integrative alternatives. The COVID-19 pandemic escalated pain management challenges. To address this, we developed a novel ED pain coach educator program providing individual, customized education sessions and integrative pain management toolkits for acute and chronic pain, followed by a one-month feedback and utilization survey.

Methods: The project was implemented in an urban US safety-net, not-for-profit hospital system and registered with the affiliated university's Quality Improvement Project Registry. Data collection occurred from January 1, 2021–December 31, 2022 with enrollment initially starting in EDs