shift. 150 (93%) ICH admitted to Pediatric/Neonatal Intensive Care Unit (PICU/NICU), 11 (7%) floor, none discharged from emergency department (ED), no deaths. Of 124 without ICH, 28 (23%) admitted PICU/NICU, 23 (19%) floor, 73 (59%) discharged home from ED. 186 (64% total) Social Work (SW), child protective team (CPT), and/or Child Protective Service (CPS) assessment; 121 (65%) with ICH vs 65 (35%) without.

Conclusion: Infants $\leq$ 3 months with skull fractures are difficult to predict presence or absence of ICH regardless of presentation or exam, unless with severe brain injury with GCS $<$ 8. Regardless of ICH type, they often present with minor mechanisms of injury, low ICH predictability with reported LOC or emesis, have minimal abnormal findings on exam, with both parents and physicians appearing inaccurate at predicting the degree of intracranial injury based on behavior. Similar to other studies, management was conservative with 4% cohort requiring surgical management. Despite this, significant numbers required PICU/NICU observation and SW/CPT/CPS consultation. Findings suggest caution assessing infants with head injuries $\leq$ 3 months of age.

No, authors do not have interests to disclose

172 The Impact of Resuscitative Transesophageal Echocardiography Performed by Emergency Physicians on Diagnosis and Management of Critically Ill Patients

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Introduction: Transesophageal echocardiography (TEE) is an emerging tool that can aid emergency physicians in treating patients in cardiac arrest and undifferentiated shock. TEE can aid in diagnosis, resuscitation, identify cardiac rhythms, guide chest compression vectors, and shorten sonographic pulse checks. The objective of this study is to evaluate proportion of patients who underwent a change in their resuscitation management as a result of emergency department resuscitative TEE.

Methods: This was a retrospective cohort study of all patients who underwent ED resuscitative TEE from 2015-2019 at an academic hospital in Toronto, Canada. The primary outcome was the proportion of patients who underwent a change in their resuscitation management as a result of resuscitative TEE. Secondary outcomes were change in working diagnosis, complications, patient disposition, and survival to hospital discharge.

Results: 25 patients (median age 71, 40% female) underwent ED resuscitative TEE. All patients were intubated prior to probe insertion. The most common indication for resuscitative TEE was cardiac arrest (16/25) followed by undifferentiated shock (7/25) and post-cardiac arrest (2/25). Resuscitative TEE was performed by senior emergency medicine residents or ultrasound fellows under direct supervision in 10 cases. Probe insertion was successful in all 25 examinations (100%) with difficult insertions occurring in 9/25. Adequate TEE views were obtained for every patient. The most commonly obtained TEE views were the mid-esophageal four chamber (100%), mid-esophageal long axis (100%), mid-esophageal descending aorta (100%), trans-gastric short axis (96%), and mid-esophageal bicaval (68%). After resuscitative TEE, the management changed in 76% (N=19) and information was diagnostically influential in 76% (N=19) of patients. Therapeutic recommendations included guidance of hemodynamic support with volume (8/25) or vasoactive medications (6/25), decision to transfer the patient to the cardiac catheterization lab (3/25), and decision to terminate resuscitation (3/25). The most common diagnostic contributions included hypovolemic shock (5/25), cardiogenic shock (4/25), pulmonary embolism (4/25), cardiac standstill (3/25), and acute coronary syndrome (2/25). Ten patients died in the ED, 15 were admitted to hospital, and eight survived to hospital discharge. There were no immediate complications (0/15) and two delayed complications (2/15), both of which were minor gastrointestinal bleeding.

Conclusions: Resuscitative TEE is emerging as a valuable diagnostic and therapeutic tool for patients with cardiac arrest and undifferentiated shock in the ED. It is a relatively new emergency medicine modality with the first use described in the ED in 2008. It has been shown that it can be relatively easily taught to operators for resuscitations in the ED. There is limited published evidence on the use of ED TEE and this study contributes important data to the literature. In this study we found that the use of ED resuscitative TEE was associated with significant therapeutic changes in critically ill patients and resulted in a higher rate of adequate cardiac visualization than TTE alone. There was a low complication rate.

Table 1: Patients who underwent emergency department resuscitative transesophageal echocardiography

Patients N=25		Presentation	Resuscitative TEE findings	Post Resuscitative TEE Diagnosis	TEE provide diagnostic clarity (19/25)	TEE influenced management (19/25)	Complications / insertion difficulty / operator Trainee N =10, 2 complications, 3 difficult insertions Staff N = 15, no complications, 2 difficult insertions	Disposition
1	66F	Shock NYD	Global hypokinesis	Cardiogenic shock	Yes	Chrono/inotropes	None / easy / staff	ICU / survived
2	56M	Shock NYD	Hyperdynamic LV, PCE	Hypovolemic shock	Yes	Fluids	None/ easy / staff	ICU / survived
3	57F	Shock NYD	Hyperdynamic LV, flat SVC	Hypovolemic shock	Yes	Fluids	None / easy / staff	ICU / survived
4	47M	Cardiac arrest PEA/asystole	RV thrombus	Pulmonary embolism	Yes	No changes	None /difficult / staff	ED / died
5	90M	Cardiac arrest VF	VF	Cardiac arrest VF	No	No changes	None/ easy / trainee	ED / died
6	63F	Cardiac arrest PEA/asystole	Hyperdynamic LV	Hypovolemic shock	Yes	Fluids	None / difficult / trainee	ICU / died
7	66M	Cardiac arrest VF	Regional wall motion abnormality, PCE	Acute coronary syndrome	Yes	Cath lab	None / easy / staff	Cath lab / died
8	80F	Shock NYD	No abnormal findings	Shock NYD	No	No changes	None / difficult / staff	ICU / survived
9	66M	Cardiac arrest PEA/asystole	Cardiac standstill	Cardiac standstill	Yes	Terminate resuscitation	None / easy /staff	ED / died
10	55F	Shock NYD	Hyperdynamic LV	Hypovolemic shock	Yes	Fluids	None / easy / staff	ICU / died
11	74F	Cardiac arrest PEA/asystole	Cardiac standstill	Cardiac standstill	Yes	Terminate resuscitation	None / easy / staff	ED / died
12	86F	Cardiac arrest PEA/asystole	Right heart strain	Pulmonary embolism	Yes	Anticoagulation	UGIB[1] / easy / trainee	ICU / survived
13	87M	Cardiac arrest PEA/asystole	Inferior regional wall motion abnormality, right heart strain	Pulmonary embolism	Yes	Thrombolytics	None / easy / trainee	ED / died
14	48M	Shock NYD	Regional wall motion abnormality, flat SVC	Cardiogenic shock	Yes	Fluids Chrono/inotropes Cath lab	None / easy / trainee	Cath lab / survived
15	92M	Cardiac arrest PEA/asystole	Hypokinetic LV	Cardiac arrest NYD	No	CPR vector change Fluids Chrono/inotropes	None / easy / staff	ED / died
16	71F	Shock NYD	Hyperdynamic LV	Hypovolemic shock	Yes	Fluids	None / easy / trainee	ICU / survived
17	49M	Cardiac arrest PEA/asystole	Regional wall motion abnormality	Acute coronary syndrome	Yes	Cath lab	None / easy / staff	Cath lab / survived
18	88M	Cardiac arrest PEA/asystole	Cardiac standstill	Cardiac standstill	Yes	Terminate resuscitation	None / difficult /trainee	ED / died
19	60F	Cardiac arrest VF	Global hypokinesis	Cardiogenic shock	Yes	Chrono/inotropes	None / easy / staff	Cath lab / died
20	83F	Cardiac arrest PEA/asystole	Global hypokinesis, PCE, MS, AS, flat SVC	Cardiogenic shock	Yes	Fluids Chrono/inotropes	UGIB[2] / difficult / trainee	ICU / died
21	95M	Cardiac arrest VF	VF	Cardiac arrest VF	No	No changes	None / easy / staff	ED / died
22	62M	Post-cardiac arrest NYD	No abnormal findings	Post-cardiac arrest NYD	No	No changes	None / easy / trainee	ICU / died
23	63M	Cardiac arrest PEA/asystole	Hyperdynamic LV, RV dilated, RV thrombus	Pulmonary embolism	Yes	Thrombolytics	None / easy / staff	ED / died
24	90M	Cardiac arrest PEA/asystole	Global hypokinesis, dilated SVC	Cardiac arrest NYD	No	CPR vector change Chrono/inotropes	None / easy / trainee	ED / died
25	76M	Post-cardiac arrest NYD	Flat SVC	Post-cardiac arrest NYD	No	No changes	None / easy / staff	ICU / died

TEE: transesophageal echocardiography, F: female, M: male, NYD: not yet diagnosed, Chrono/inotropes: initiate or escalate chronotropes or inotropes, ICU: intensive care unit, LV: left ventricle, PCE: pericardial effusion, Fluids: intravenous crystalloid or packed red blood cells, SVC: superior vena cava, PEA: pulseless electrical activity, VF: ventricular fibrillation, pVT: pulseless ventricular tachycardia, RV: right ventricle, ED: emergency department, Cath lab: interventional cardiology catheterization lab, CPR: cardiopulmonary resuscitation chest compressions, MS: mitral stenosis, AS: aortic stenosis

[1]UGIB (upper gastrointestinal bleed): coffee ground fluid suctioned from the nasogastric tube on the same day as the TEE after receiving systemic anticoagulation for a pulmonary embolism, they were admitted to the ICU and started a proton pump inhibitor infusion, there was no drop in hemoglobin and did not require blood transfusion, survived to hospital discharge

[2]UGIB (upper gastrointestinal bleed): maroon coloured fluid suctioned from the nasogastric tube on the same day as the TEE, started on a PPI infusion. This patient had a history of lower gastrointestinal bleeding and was taking aspirin 81mg daily.

No, authors do not have interests to disclose

173 Leveraging Syndromic Surveillance Data to Create Emergency Department COVID19 Data Visualization Tool

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Study Objective: This program worked to identify and evaluate the utility of a rapidly deployed syndromic surveillance tool in improving awareness of public health crises within the emergency department.

Background: Emergency departments saw a dramatic drop in the number of patients presenting for care in the early part of the pandemic. That decrease in volume led to a decrease in revenue. Directors and administrative personnel needed to match staffing to anticipated patient volume in order to be financial stewards. Additionally, as emergency departments are the frontline responders to public health emergencies, increased information around PHE risk in these areas allows for better and more efficient response efforts.

Methods: During this time, the American College of Emergency Physicians (ACEP) established a relationship with the National Syndromic Surveillance Program (NSSP) to acquire aggregate data on country regions. This project was established and funded in part by a cooperative agreement with the Centers for Disease Control and Prevention (grant number 1 NU50CK000570). This data was displayed for our members in a 'data visualization' program on our Web site. This data was free and open to anyone accessing the ACEP Web site.

Results: COVID19 dashboard included visualizations of US emergency department (ED) data across three categories: total visits, COVID-like illness visits, and influenza-like illness visits. The data are available at both national and Health and Human Services (HHS) regional resolutions & across several timescales (eg, 7-day, 30-day, 90-day). Data are obtained from the U.S. Centers for Disease Control and Prevention through the National Syndromic Surveillance Program (01/01/2019-05/10/2022). Data and visualizations were updated weekly. Included below are images from the existing Web page showing the actual visualization for the country. Each visualization can be drilled down to the DHHS region. The data was accessed 6,165 times with 5,229 unique visits since it was placed on the Web site on January 1, 2021. This data has been beneficial during the recovery period, when visits stabilized, and more recently during the resurgence of cases, particularly the Delta variant. As seen in the figures, data was most frequently accessed during times of COVID19 surges. In addition, it is hoped that emergency physicians who utilize this data will be more supportive of the efforts of NSSP going forward. In late 2021, the data visualization page was expanded to include anecdotal self-reporting of observed breakthrough cases in a novel approach to identifying rates and risk factors for breakthrough cases. Since its launch in January 2022, has been viewed more than 250 times with 225 unique page views. Similar to the original COVID-19 data visualization page, this syndrome-based breakthrough data has been utilized most frequently during recent surges and outbreaks.

Conclusion: Rapid utilization of surveillance data in data visualization efforts provides valuable tools for frontline providers to assess public health emergency risk and determine appropriate response actions and resource planning.

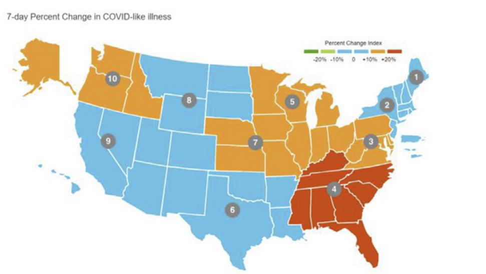

Image 1. National 7-day Percent Change in ED COVID-like Illness

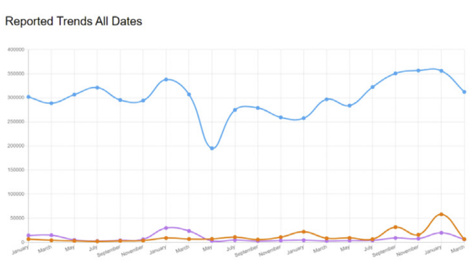

Image 2. National Reported Trends All Dates

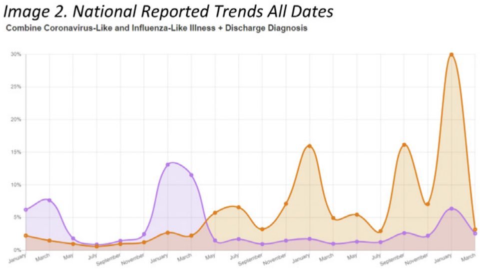

Image 3. Trends in Emergency Department Visits for CLI + DD and ILI + DD

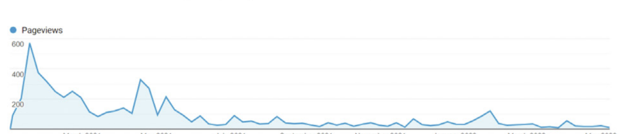

Image 4. ACEP COVID19 Data Visualization Page Views

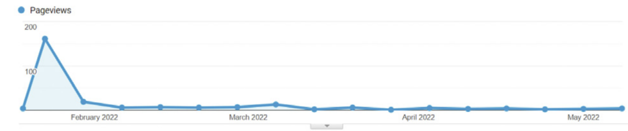

Image 5. ACEP Breakthrough Case Data Visualization Page Views

No, authors do not have interests to disclose

EMF 174 Acute and Recurrent Firearm Injury Rates in an Urban Population (2010-2021): Using Machine Learning to Improve Classification

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Study Objectives: Firearm injury is the leading cause of death in children and young adults in the United States. In 2018, Washington University in St. Louis (WUSTL) developed the St. Louis Hospital-based Violence Intervention Program Data Repository (STL-HVIP-DR) from hospital administrative data. This repository shares data on traumatically injured patients (blunt assault, stabbing, firearm injury) across the two research universities (WUSTL and St. Louis University) and their four associated adult and pediatric level-I trauma hospitals. These hospitals care for the majority of firearm injured patients in St. Louis, thereby creating a region-wide longitudinal registry of ED and hospital-treated firearm injuries. The primary objective is to apply a machine learning classification model to estimate the rate of acute and recurrent firearm injuries in an urban population.

Methods: This was a retrospective cohort study of firearm-injured patients form 01/01/2010—12/31/2020 captured in the STL-HVIP-DR. Variables included patient demographics (name, date of birth, sex, race, ethnicity, zip code of residence), hospital of presentation, ED and hospital arrival and discharge timestamps, ICD 9 and 10 codes, insurance payer/carrier, and disposition (discharge, admit, death). We included all patients with at least one ICD code for firearm injury. From those, we randomly selected 500 patients with 808 unique visits for physician manual review of all their medical encounters for firearm injury. These data were used to build and internally validate a machine learning classification model to predict whether a firearm injury was a "true" acute injury or a "false" follow-up visit associated with a prior injury (eg, pain or wound check). These visits were randomly split into training (70%) and test (30%) datasets. Our model was generated using least absolute shrinkage and selection operator (LASSO) regression. Model covariates were chosen to classify on clinical presentation (eg, diagnostic codes, injury severity, admission type). We evaluated model performance with area under the curve (AUC) and its 95% confidence interval (CI). This model was then applied to all firearm injury visits in the STL-HVIP-DR linked with the National Death Index (NDI) to estimate acute and recurrent firearm injury rates.

Results: There were 135,301 medical visits for 99,456 unique patients in the STL-HVIP-DR and 22,584 visits had at least one firearm injury diagnosis for 13,442 unique patients (Table 1). The classification model had high accuracy with AUC = 0.91 (95% CI 0.86-0.95). When applied to all 22,584 firearm injury visits 13,606 (60.2%) visits were classified as a "true" acute firearm injury. Of the 13,442 unique patients, 1,413 (10.5%) were estimated as presenting with a recurrent firearm injury.

Conclusion: The classification model presented herein is a viable methodology to identify "true" acute firearm injuries. Our injury rate calculations are strengthened by our robust sample size, data from multi-system adult and pediatric trauma hospitals, and data linkage with the NDI. There is a need to accurately identify acute firearm injuries to better define the burden of this disease, and to facilitate robust impact evaluation of violence intervention programs. This model improves on our team's prior efforts to accurately identify acute and recurrent firearm injuries from firearm-associated ICD codes alone.