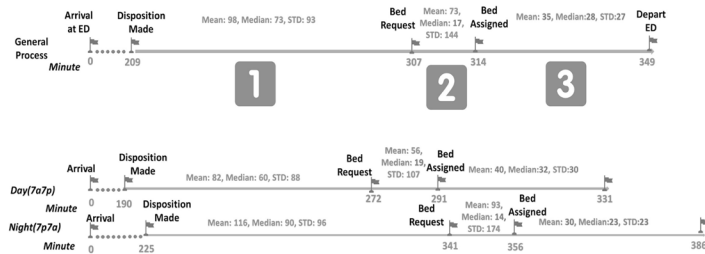


This project demonstrated a synergistic educational experience that allowed the blending of medical education with process engineering, ultimately improving knowledge gaps of both. This unique process allowed for diagnostics to be performed that were necessary for the ED and simultaneously provided a stronger foundation for QI undertakings for both engineering and medical students.

**Conclusion:** Medical students can benefit from working alongside systems engineers, allowing them to see the value of using tools (simulation modeling, statistical analysis, process flow mapping, etc.) to uncover evidence-based improvements to a variety of medical processes. Healthcare systems engineering students can gain valuable experience in a complex medical environment. Looking for solutions to the disparity between flow during the day and night is an opportunity for future study.



### 3 Scenario-based Pilot Testing of EMS Provider Interpretation of a Novel Pediatric Triage Protocol

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**Introduction:** Pediatric care is increasingly concentrated in a small number of hospitals. No widely operative triage protocols guide emergency medical services' (EMS) pediatric destination decision for nontrauma patients. The PDTree tool is an evidence-based protocol validated by expert consensus, which was developed to assist EMS providers' in choosing a pediatric destination facility capable of definitive care. The PDTree defines four tiers of pediatric care (specialty/trauma center, comprehensive pediatric facility, regional pediatric facility and closest ED), and matches patients by condition and EMS assessment.

**Objective:** To pilot test the PDTree tool with practicing EMS providers for accuracy of interpretation and performance across the range of practice levels and prior experience.

**Methods:** Maryland EMS providers voluntarily participated in online testing. Demographic data included certification level, location of primary EMS jurisdiction, and years of experience. Providers were provided with a copy of the PDTree tool and presented 14 patient scenarios; each scenario was written to match one condition description in the PDTree tool with a clear recommendation for destination facility capability level. For each scenario, providers were asked to name their most likely destination, and to select the level of care suggested by their interpretation of the PDTree tool.

**Results:** 100 providers (52 ALS, 48 BLS) completed the electronic pilot test. Providers named a destination hospital with appropriate capabilities in 60% of scenarios. Providers' interpretation of the PDTree's advised destination level agreed with the intended response for 71% of scenarios. Greater than 90% agreement was seen for burns, witnessed child abuse, and cervical spine injury. Less than 50% agreement was seen for shock and a nondistressed child with a tracheostomy. Rates of agreement differed for diabetic ketoacidosis and nondistressed medically complex child based on provider level, and for elbow injury with deformity with years of experience (Chi Square p value = 0.01 and p value = 0.04, respectively).

**Conclusion:** EMS providers accurately interpreted the PDTree tool to determine the advised destination for a majority of pediatric scenarios. Future evaluation will focus on conditions with lower rates of agreement to determine if educational interventions or tool alterations are required. Virtual pilot testing using clinical vignettes is a reasonable first step in assessing the usability of a novel clinical decision-making tool.

**Acknowledgement:** Funding was provided by a grant from the United States Health Resources and Service Administration (HRSA-16-053: PDTree: A Tool for Prehospital Pediatric Destination Choice).

### 4 The Incidence of Infected Patients Identified Through a Sepsis Order Bundle

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**Introduction:** Sepsis order sets improve compliance with the established guidelines, but clinicians must be careful to initiate these protocols on appropriate patients. Many conditions can mimic sepsis as defined by SEP-1 (two or more SIRS\* criteria and a suspected infection) such as trauma, COPD, etc. SEP-1 criteria alone can lead to initiating a sepsis protocol without true infection based solely on vital signs.

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**Objective:** To assess the incidence of patients who had a sepsis order set, but an infection was not discovered during their hospital course.

**Methods:** This study is a single-center retrospective chart review of all “SIRS positive” patients >21 years old who presented to a busy community ED who had the sepsis order set initiated from the emergency department in 2017. A total of 1577 encounters met inclusion criteria. The discharge diagnoses were reviewed to identify unique diagnoses. Similar diagnoses (e.g. RLQ abdominal pain and abdominal pain) were grouped together into the more generalized diagnosis. Several of the unique discharge diagnoses (161) were vague and required individual chart review by two people.

**Results:** Two hundred fifty-one unique discharge diagnoses were identified and then categorized as infectious or not. Conditions which may be inflammatory versus infectious (e.g. diverticulitis), but are classically treated with antibiotics were counted as infectious. One hundred sixty-one charts were reviewed by two physicians, of which, 130 (81%) were identified as having an infectious condition (K = 0.87). The most common sepsis mimic was abdominal pain, followed by COPD, and cough. A third (33.6%) did not have an infection identified.

**Conclusion:** SEP-1 criteria for diagnosis and treating sepsis are not specific, with one-third false positives. Identification criteria with higher specificity is needed, and may reduce healthcare expense.

\*SIRS (Systemic Inflammatory Response Syndrome) is defined as temperature > 38C° or < 36C°, heart rate > 90 beats per minute, respiratory rate > 20 or PaCO<sub>2</sub> < 32 mmHg, and WBC > 12k or < 4k/mm<sup>3</sup>.

## 5 Attitudes, Behavior, and Knowledge of Emergency Medicine Healthcare Providers Regarding LGBT+ Patient Care

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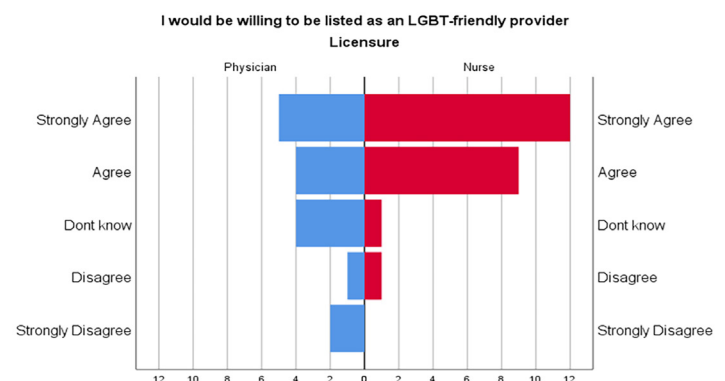
**Introduction:** There is evidence that healthcare providers are lacking in knowledge and confidence when it comes to treating LGBT+ patients.

**Objective:** To assess providers’ LGBT+ health-care knowledge, willingness to treat LGBT+ patients, communication behaviors, and whether there is a need for additional training. This involved an assessment that measured respondents’ knowledge of LGBT+ patients’ reluctance to communicate with providers, risk for certain cancers, and risk for suicide. Secondary outcomes assessed providers’ attitudes and practices toward LGBT+ patients.

**Methods:** 16 physicians and 24 nurses in the emergency department of an urban Level 1 trauma center were asked to participate in a survey regarding LGBT+ health. The survey was modified from published work and included questions about transgender patients. The effects of age, gender, and type of provider were contrasted with their willingness to treat and knowledge of LGBT+ healthcare. Descriptive statistics, Fisher’s exact test, and the Wilcoxon rank-sum and Kruskal-Wallis tests were used. This study was approved by the IRB and all data was de-identified.

**Results:** Compared to nurses, physicians were 9.0 (95% CI: 2.09–38.79) times more likely to agree with the statement “LGBT+ patients avoid accessing healthcare due to difficulty communicating with providers” (p=.003). Further, providers under the age 45 had a higher level of agreement with the statement “There should be more education in health professional schools on LGBT+ health needs” (p=.03) and with “being listed as an LGBT-friendly provider” (p=.001), as did nurses (p = .04) and those who identify as LGBT+ or know someone who identifies as LGBT+ (p=.005). Finally, respondents reported higher agreement to the statement “There should be educational events at my hospital about LGBT+ health needs” (Mdn=4, IQR=3–5) than to “I am well informed on the health needs of the LGBT patients” (Mdn=2, IQR=2–3).

**Conclusions:** There is a need and desire for educational events at the professional school and provider level, in addition it is recommended to conduct an educational intervention.



		There should be educational events at my hospital about LGBT health needs.									
		Strongly Disagree		Disagree		Don't know		Agree		Strongly Agree	
		n	Row%	n	Row%	n	Row%	n	Row%	n	Row%
I am well informed on the health needs of the LGBT patients.	Strongly Disagree	0	0.0%	1	25.0%	0	0.0%	1	25.0%	2	50.0%
	Disagree	0	0.0%	1	5.0%	4	20.0%	11	55.0%	4	20.0%
	Don't know	0	0.0%	0	0.0%	3	42.9%	2	28.6%	2	28.6%
	Agree	0	0.0%	0	0.0%	0	0.0%	2	28.6%	5	71.4%
	Strongly Agree	2	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	<b>Total</b>	<b>2</b>	<b>5.0%</b>	<b>2</b>	<b>5.0%</b>	<b>7</b>	<b>17.5%</b>	<b>16</b>	<b>40.0%</b>	<b>13</b>	<b>32.5%</b>

Note: Wilcoxon signed rank z = 4.03, p < .001