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We strive to grow the global development of our specialty around the Mediterranean basin, and indeed around the world. We endorse physician wellness, residency training, and quality, lifelong education in emergency medicine. All patients should have access to care by qualified emergency physicians and systems of care. MEMC19 is an opportunity to share the very best practices from high-resource countries with mature systems, countries that have recently achieved specialty status, and low- resource countries delivering care even in austere environments.

Our sessions cover aspects such as acute cardiac conditions, critical care, basic and advanced ultrasound, immigrant and refugee health, tactical and military medicine, trauma resuscitation, toxicology, prehospital care systems, and much more.

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Professor Mark I. Langdorf, MD, MHPE, FACEP, FAAEM, RDMS
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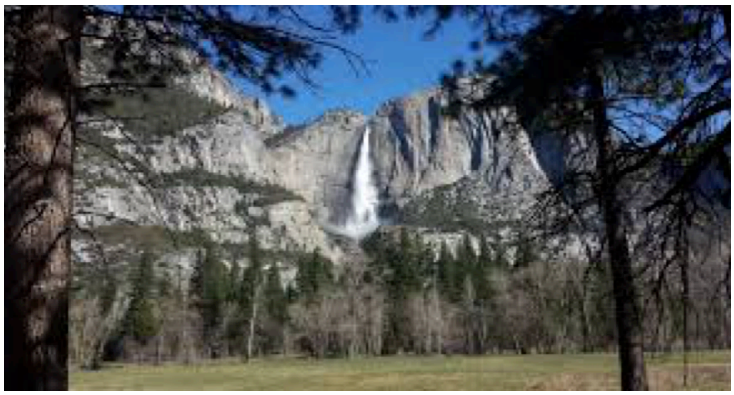

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1 Ultrasound for the Diagnosis of Diverticulitis: A Systematic Review and Meta-analysis

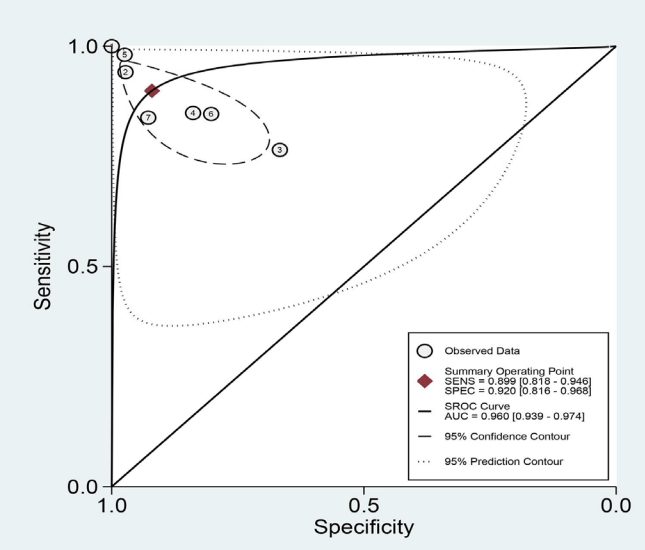
Holladay D[1], Fullmer R[2], Peksa G[1], Gottlieb M[1] / [1]Rush University Medical Center, Chicago IL, USA; [2]Swedish Covenant Hospital, Chicago IL, USA

Objective: Diverticulitis is a commonly encountered diagnosis in the emergency department (ED). Computed tomography (CT) of the abdomen and pelvis is the most commonly used imaging modality for diagnosis. However, CT has several disadvantages including radiation, cost, availability, and possible contrast-induced nephropathy. Ultrasound offers a portable, less costly alternative without radiation or contrast.

Design and Method: We conducted a search of PubMed, Embase, Scopus, the Cochrane Database of Systematic Reviews, Cochrane Central Register, CINAHL, and LILACS for prospective trials evaluating the accuracy of ultrasound for diverticulitis. Two physician-investigators independently extracted data from the included studies into a pre-designed data collection form. Studies were independently assessed for quality by two separate physician-investigators using the Quality Assessment of Diagnostic Accuracy Studies (QUADAS-2) tool.

Results: This systematic review identified seven studies comprising 700 total patients. Overall, ultrasound was found to be 89.9% sensitive (95% confidence interval [CI], 81.8-94.6%) and 92.6% specific (95% CI, 81.6-96.8%) with a positive likelihood ratio of 11.3 (95% CI, 4.4 to 28.6) and a negative likelihood ratio of 0.11 (95% CI, 0.06 to 0.21).

Conclusion: This review demonstrates that ultrasound is sensitive and specific for the diagnosis of diverticulitis and may offer an alternative to computed tomographyCT. Further studies should be performed in the ED population and by emergency medicine providers.



2 Association of Response Time Interval and Good Neurological Outcome According to Bystander Cardiopulmonary Resuscitation

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Objective: Response time interval (RTI), which refers to the time between the victim's collapse and a response by emergency medical services (EMS), is crucial in determining the initiation of cardiopulmonary resuscitation (CPR) and subsequent patient outcome. Our goal was to determine the different effects of RTI by bystander CPR on good neurological outcome. We hypothesized that bystander CPR would ensure a good score on the cerebral performance categories (CPC) scale and affect RTI.

Design and Methods: We conducted a retrospective, observational study with Pan-Asian Resuscitation Outcome Study data from January 2009–December 2016. Four Asian countries (Japan, Taiwan, South Korea, and Singapore) were selected. We included EMS treated, non-traumatic, witnessed out-of-hospital cardiac arrest cases (OHCA), while excluding cases involving cardiac arrest that occurred in nursing homes, had been witnessed by an emergency medical technician EMT, or was without sufficient data . General demographics, prehospital cardiac arrest details, response time, and clinical outcome were collected and analyzed. Primary outcome was good neurologic outcome.

Results: We analyzed 13,245 OHCA cases. Primary shockable electrocardiogram and prehospital defibrillation rate were higher in bystander CPR cases compared to the no-bystander CPR group (28.9%, 34.5% vs 21.1%, 26.8%). Prehospital advanced airway and epinephrine were more performed in the non-bystander CPR group (41.9%, 17.8% vs 47.1%, 20.2%). Median RTI by EMS was about six minutes. Survival discharge and good neurological recovery were higher in the bystander CPR group (15.5%, 10.2% vs 8.5%, 4.1%). Adjusted odd ratio for good neurologic outcome with RTI > 6 minutes compared to < 6 minutes was 0.62 (95% confidence interval [CI], 0.53-0.74) for the non-bystander CPR group but 0.71 (95% CI, 0.59-0.86) for the bystander CPR group. Dividing RTI time ranges by three-minute intervals, we found that good neurological outcome and survival discharge were only significant within three to six minutes in the non-bystander CPR group, but the significant RTI time range in the bystander CPR group was three to nine minutes.

Conclusion: Good neurologic outcome after cardiac arrest was higher in cases with bystander CPR. We also found that as the response time interval increased, slower deterioration of good neurologic recovery outcome was shown in cardiac arrest patients with bystander CPR performed.

Table 1. Flowchart.

Total PAROS OHCA cases	65413	Total Excluded	
		Age < 18	928
Age > 17 (18 or older)	64485		
		Noncardiac	24642
Cardiac cause	39843		
		Bystander unknown	35
Bystander CPR	39808		
		Unwitnessed	23270
		Nursing home	593
		EMT witnessed	2701
		Found in ambulance	11
		No arrest time	23
Total included	13245		

PAROS, Pan-Asian Resuscitation Outcomes Study; *OHCA*, out-of-hospital cardiac arrest; *EMT,* emergency medical technician; CPR, cardiopulmonary resuscitation.

Table 2. Demographics by bystander CPR.

	All		Bystander CPR				P-value
			No		Yes		
	N	%	N	%	N	%	
All	13245	100	7234	100	6011	100	
City							<0.0001
Tokyo	4345	32.8	2451	33.9	1894	31.5	
Osaka	2585	19.5	1581	21.9	1004	16.7	
Aichi	2541	19.2	998	13.8	1543	25.7	
Seoul	2246	17.0	1135	15.7	1111	18.5	
Taipei	466	3.5	291	4.0	175	2.9	
Singapore	1062	8.0	778	10.8	284	4.7	
Gender							0.518
Female	4595	34.7	2492	34.4	2103	35.0	
Male	8650	65.3	4742	65.6	3908	65.0	
Age group							
Adult	3960	29.9	2024	28.0	1936	32.2	
Elderly	9285	70.1	5210	72.0	4075	67.8	
Median (q1-q3)	74(62-83)		74(63-83)		74(60-84)		0.1416
Place							
Private	4729	35.7	2942	40.7	1787	29.7	
Public	1254	9.5	660	9.1	594	9.9	
Unknown	7262	54.8	3632	50.2	3630	60.4	
ECG							
Shockable	3261	24.6	1524	21.1	1737	28.9	
Non-shockable	9781	73.8	5597	77.4	4184	69.6	
Unknown	203	1.5	113	1.6	90	1.5	
RTI group							
Short	7238	54.6	4051	56.0	3187	53.0	
Long	6007	45.4	3183	44.0	2824	47.0	
Median (q1-q3)	6(5-8)		6(5-8)		6(5-8)		<0.0001
EMS DEF							<0.0001
No	9232	69.7	5295	73.2	3937	65.5	
Yes	4013	30.3	1939	26.8	2074	34.5	
Airway							<0.0001
Advanced	5919	44.7	3403	47.0	2516	41.9	
Basic	7004	52.9	3665	50.7	3339	55.5	
Unknown	322	2.4	166	2.3	156	2.6	
EMS epinephrine							0.0005
No	10718	80.9	5776	79.8	4942	82.2	
Yes	2527	19.1	1458	20.2	1069	17.8	
Outcomes							
Survival	1549	11.7	617	8.5	932	15.5	<.0001
Good CPC	909	6.9	298	4.1	611	10.2	<.0001

PAROS, Pan-Asian Resuscitation Outcomes Study; *OHCA*, out-of-hospital cardiac arrest; *RTI*, response time interval; *ECG*, electrocardiogram; *EMS*, emergency medical services; *CPR*, cardiopulmonary resuscitation; *CPC*, cerebral performance categories scale.

Table 3. Demographics by response time interval of six minutes.

	All		RTI				P-value
			Short		Long		
	N	%	N	%	N	%	
All	13245	100.0	7238	100.0	6007	100.0	
City							<0.0001
Tokyo	4345	32.8	2638	36.4	1707	28.4	
Osaka	2585	19.5	1464	20.2	1121	18.7	
Aichi	2541	19.2	1132	15.6	1409	23.5	
Seoul	2246	17.0	1408	19.5	838	14.0	
Taipei	466	3.5	331	4.6	135	2.2	
Singapore	1062	8.0	265	3.7	797	13.3	
Gender							0.133
Female	4595	34.7	2552	35.3	2043	34.0	
Male	8650	65.3	4686	64.7	3964	66.0	
Age group							0.2369
Adult	3960	29.9	2133	29.5	1827	30.4	
Elderly	9285	70.1	5105	70.5	4180	69.6	
Median (q1-q3)	74(62-83)		74(62-83)		74(61-83)		0.2291
Place							0.7818
Private	4729	35.7	2565	35.4	2164	36.0	
Public	1254	9.5	688	9.5	566	9.4	
Unknown	7262	54.8	3985	55.1	3277	54.6	
ECG							0.0001
Shockable	3261	24.6	1867	25.8	1394	23.2	
Non-shockable	9781	73.8	5244	72.5	4537	75.5	
Unknown	203	1.5	127	1.8	76	1.3	
Bystander CPR							0.0006
No	7234	54.6	4051	56.0	3183	53.0	
Yes	6011	45.4	3187	44.0	2824	47.0	
EMS DEF							0.0034
No	9232	69.7	4968	68.6	4264	71.0	
Yes	4013	30.3	2270	31.4	1743	29.0	
Airway							
Advanced	5919	44.7	2952	40.8	2967	49.4	<0.0001
Basic	7004	52.9	4084	56.4	2920	48.6	
Unknown	322	2.4	202	2.8	120	2.0	
EMS Epinephrine							
No	10718	80.9	6033	83.4	4685	78.0	<0.0001
Yes	2527	19.1	1205	16.6	1322	22.0	
Outcomes							
Survival	1549	11.7	982	13.6	567	9.4	<0.0001
Good CPC	909	6.9	593	8.2	316	5.3	<0.0001

RTI, response time interval; *ECG*, electrocardiogram; *EMS*, emergency medical services; *CPR*, cardiopulmonary resuscitation; *CPC*, cerebral performance categories scale.

Table 4. Odds ratio of outcome by response time interval (by six minutes) and bystander cardiopulmonary resuscitation.

	Total	Positive		Crude			Adjusted		
	N	N	%	OR	95% CI		OR	95% CI	
Good CPC									
Total	13245	909	6.9						
Short	7238	593	8.2	1.00			1.00		
Long	6007	316	5.3	0.62	0.54	0.72	0.65	0.56	0.76
Survival									
Total	13245	1549	11.7						
Short	7238	982	13.6	1.00			1.00		
Long	6007	567	9.4	0.66	0.60	0.74	0.69	0.61	0.77
	Total	Positive		Crude			Adjusted		
	N	N	%	OR	95% CI		OR	95% CI	
Good CPC									
Total	13245	909	6.9						
No	7234	298	4.1	1.00			1.00		
Yes	6011	611	10.2	2.63	2.28	3.04	2.18	1.87	2.54
Survival									
Total	13245	1549	11.7						
No	7234	617	8.5	1.00			1.00		
Yes	6011	932	15.5	1.97	1.77	2.19	1.68	1.49	1.89

CPC, cerebral performance categories scale; *CI*, confidence interval; *RTI,* response time interval; *OR*, odds ratio.

Table 5. Interaction analysis of response time interval and bystander-performed cardiopulmonary resuscitation outcomes.

		Bystander CPR (-)			Bystander CPR (+)		
Outcomes	RTI	AOR	95% CI		AOR	95% CI	
Good CPC							
	RTI>=6 vs. RTI <6	0.62	0.53	0.74	0.71	0.59	0.86
	3<RTI<=6 vs. RTI =<3	1.42	1.17	1.73	2.02	1.62	2.52
	6<RTI<=9 vs. RTI =<3	1.16	0.96	1.42	1.82	1.48	2.25
	9<RTI<=12 vs. RTI =<3	0.88	0.68	1.14	1.20	0.89	1.62
	12<RTI<=60 vs. RTI =<3	0.46	0.27	0.77	0.86	0.53	1.40
Survival							
	RTI>=6 vs. RTI <6	0.83	0.78	0.88	0.84	0.78	0.91
	3<RTI<=6 vs. RTI =<3	1.31	1.15	1.51	1.66	1.41	1.96
	6<RTI<=9 vs. RTI =<3	1.05	0.91	1.20	1.43	1.22	1.67
	9<RTI<=12 vs. RTI =<3	0.89	0.75	1.07	1.06	0.84	1.34
	12<RTI<=60 vs. RTI =<3	0.45	0.32	0.62	0.63	0.43	0.93

CPR, cardiopulmonary resuscitation; *CPC*, cerebral performance categories scale; *RTI*, response time interval; *AOR*, adjusted odds ratio; *CI*, confidence interval.

3 Comparison of the Effect of Audio and Video-Instructed Dispatcher-Assisted CPR on Outcomes After Out-of-Hospital Cardiac Arrest

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Introduction: This study aimed to compare the effect of audio-instructed dispatcher-assisted cardiopulmonary resuscitation (DA-CPR) and video-instructed DA-CPR on resuscitation outcome after out-of-hospital cardiac arrest (OHCA) in the real world.

Methods: We conducted a cross-sectional study for resuscitation-attempted adult OHCAs in Seoul, Korea. In 2017 the dispatch center of Seoul introduced video-instructed DA-CPR; the center had used audio-instructed DA-CPR since implementation in 2010. When more than two bystanders were on the scene and could handle a video-call, a dispatcher would call them back and instruct them in how to perform CPR via the video-call. In other situations, dispatchers would provide standard audio-instructed DA-CPR. The primary outcome was survival to discharge. The secondary outcome was good neurological outcome at hospital discharge. The tertiary outcome was early instruction time interval (ITI), which measured time from the call to the initiation of CPR instruction 90seconds). We then compared the outcomes of DA-CPR (audio group) vs video-instructed DA-CPR (video group). We performed a multivariable logistic regression analysis and calculated adjusted odds ratios (AOR) with 95% confidence intervals (CI), adjusting for potential confounders. The propensity score matching (PSM) method was used to increase comparability of the two groups, and we used the same logistic regression model for the PSM population.

Results: We evaluated a total of 1720 eligible OHCA cases (1489 in the audio and 231 in the video group) ..The median ITI was 136 seconds in the audio group vs 122 seconds in the video group (p=0.12). Survival to discharge was 8.9% in the audio group and 14.3% in the video group (p<0.01). A good neurological outcome was 5.8% in the audio group and 10.4% in the video group (p<0.01). Compared with the audio group, the AORs (95% CIs) for survival to discharge, good neurological outcome and early ITI of the video group were 1.20 (0.74 to 1.94), 1.28 (0.73 to 2.26) and 1.00 (0.70 t0 1.43), respectively. PSM population showed similar results with the original population.

Conclusion: Compared with audio-instructed DA-CPR, video-instructed DA-CPR was not associated with survival improvement in the observational study conducted in one metropolitan city. A randomized, controlled trial would be needed to compare the true effect of video- vs audio-instructed DA-CPR.

4 Changes in Opioid Prescribing in Two Urban Emergency Departments from 2011-2016

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Objective: In 2011, emergency department (ED) providers were identified as one of the top five opioid prescribers in all age groups under 40 years. Since that time, ED providers have worked to address unsafe opioid-prescribing practices amid the growing opioid epidemic and to develop safer clinical practice strategies and guidelines. We sought to describe the change in annual opioid prescription rates and primary diagnoses for patient encounters discharged from the ED.

Methods: This retrospective study used electronic health records for all patients discharged with and without an opioid prescription from two urban, academic EDs from 2011 – 2016, with no exclusion criteria. We used the *International Classification of Diseases*, 9th and 10th editions (ICD-9 and ICD-10, respectively) codes to categorize discharge diagnoses. The proportion of discharges with an opioid prescription relative to total discharges was calculated by year and also by clinical and demographic characteristics. We performed descriptive statistics including chi-squared tests to describe the change over time in opioid prescription rates.

Results: Of 469,358 discharged patients, 56,684 (12.1%) received an opioid prescription from 2011-2016; 54.5% were female, and mean (standard deviation) age was 44.4 years (16.0). Over time, the proportion of opioid prescriptions decreased, with the highest in 2011 (23.0%) and the lowest in 2016 (5.7%) (p<0.001). The top five diagnostic categories, representing >80% of all opioid encounters, were as follows: injury; poisoning and other external causes (36.6%); musculoskeletal system and connective tissue conditions (17.1%); symptoms, signs, abnormal clinical and laboratory findings, and ill-defined conditions (12.7%); digestive system conditions (8.5%); and genitourinary system conditions (7.8%). In 2011, 45.0% and 44.2% of discharges with a diagnosis involving digestive system conditions and musculoskeletal system/connective tissue conditions, respectively, received an opioid prescription compared to 11.8% and 9.1% in 2016 (p<0.001).

Conclusion: The proportion of discharged patients receiving an opioid decreased by 75% between 2011 and 2016, with focused education and increased awareness. Rates of opioid prescribing decreased for all diagnostic categories, notably for diseases involving musculoskeletal/connective tissue, the digestive system, injury, poisoning and external causes, and neoplasms.

5 Nationwide Potential for Uncontrolled Donations after Cardiac Death in the Era of Extracorporeal Cardiopulmonary Resuscitation

Latiff E[1], Ho A FW[2,3], Shahidah N[4], Ng YY[5], Leong BSH[6], HGan HN[7], Mao DR[8], Chia MYC[5], Cheah SO[9], Ong, MEH[4,10] / [1]Yong Loo Lin School of Medicine, National University of Singapore, Singapore; [2] SingHealth Duke-NUS Emergency Medicine Academic Clinical Programme, Singapore; [3]Cardiovascular and Metabolic Disorders Programme, Duke-NUS Medical School, Singapore; [4]Department of Emergency Medicine, Singapore General Hospital, Singapore; [5]Emergency Department, Tan Tock Seng Hospital, Singapore; [6]Emergency Medicine Department, National University Hospital, Singapore; [7]Accident & Emergency, Changi General Hospital, Singapore; [8]Department of Acute and Emergency Care, Khoo Teck Puat Hospital, Singapore; [9]Emergency Medicine Department, Ng Teng Fong General Hospital, Singapore; [10]Health Services & Systems Research, Duke-NUS Medical School, Singapore

Objective: One organ donor can save 10 or more lives. Despite legislating an opt-out programme in Singapore, rates of organ donation and transplant are still low. This study explored the potential national numbers for uncontrolled donations after cardiac death (uDCD) amongst out-of-hospital cardiac arrest (OHCA) patients in Singapore. In addition, we also attempted to explore the influence of extracorporeal cardiopulmonary resuscitation (ECPR) on uDCD, and the possible negative effects on potential survivors.

Design and Method: We analysed OHCA cases from 2010–2016 in the Pan-Asian Resuscitation Outcomes Study. Four established criteria for identifying individuals eligible for uDCD (Madrid, Maastricht, Paris, and San Carlos Madrid) were retrospectively applied onto the population. Within these four groups we applied a condensed ECPR eligibility criteria, and thereafter applied an estimated ECPR survival rate, extrapolating for possible survivors if ECPR had been applied, assuming a neurologically- intact survival rate of 12.3% (derived from literature reviews).

Results: A total of 12,546 cases qualified for analysis. The four criteria produced four groups eligible for uDCD: Madrid (n = 1202, 9.6%); Maastricht (range (n) = 1987-2460, 15.8-19.6%); Paris (range (n) = 544-648, 4.3-5.1%); and San Carlos Madrid (n = 660, 5.3%). Within these groups, a subset would have been eligible for ECPR: Madrid (n = 208); Maastricht (n = 266); Paris (n = 102); and San Carlos Madrid (n = 152). From these, the potential numbers of neurologically-intact survivors were as follows: Madrid (n = 26, 2.1%); Maastricht (n = 33, 1.3-1.6%); Paris (n = 13, 1.9-2.3%); and San Carlos Madrid (n = 19, 2.8%).

Conclusion: The potential exists to increase the organ donor pool in Singapore by shifting from current criteria of neurological death to cardiac death. A small proportion of these patients qualified for ECPR. However, sizeable numbers of cases were suggested for organ donation despite the possibility of eventually attaining neurologically-favourable recovery through ECPR.

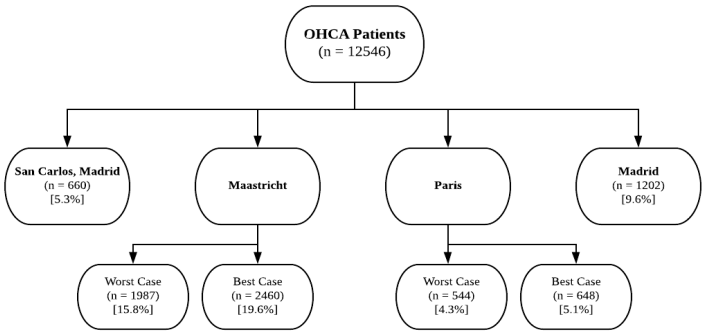


Figure 1. Compiled potential uDCD organ donor numbers. *uDCD*, uncontrolled donations after cardiac death; *OCHA*, out-of-hospital cardiac arrest.

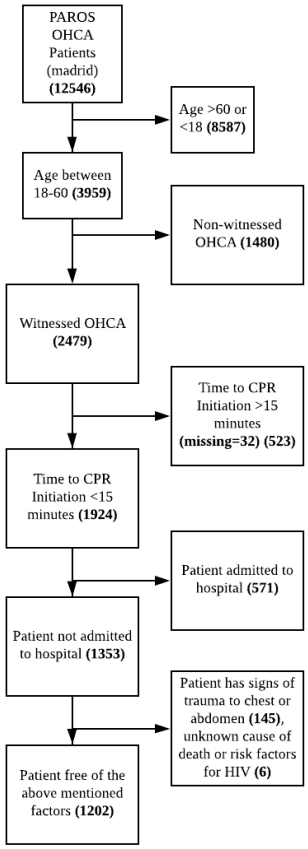


Figure 2.1. Application of Madrid criteria. *PAROS*, Pan-Asian Resuscitation Outcomes Study; *OHCA*, out-of-hospital cardiac arrest; *HIV*, human immunodeficiency virus.

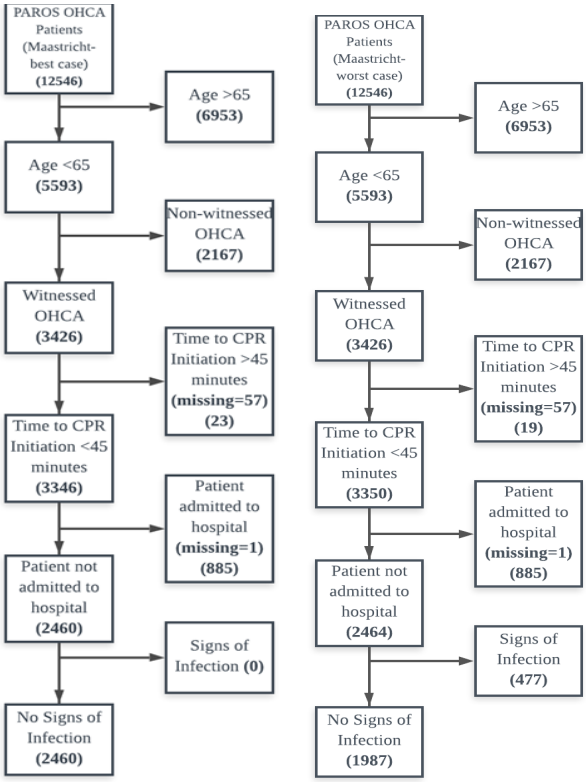


Figure 2.1. Application of Maastricht criteria.
PAROS, Pan-Asian Resuscitation Outcomes Study; *OHCA*, out-of-hospital cardiac arrest.

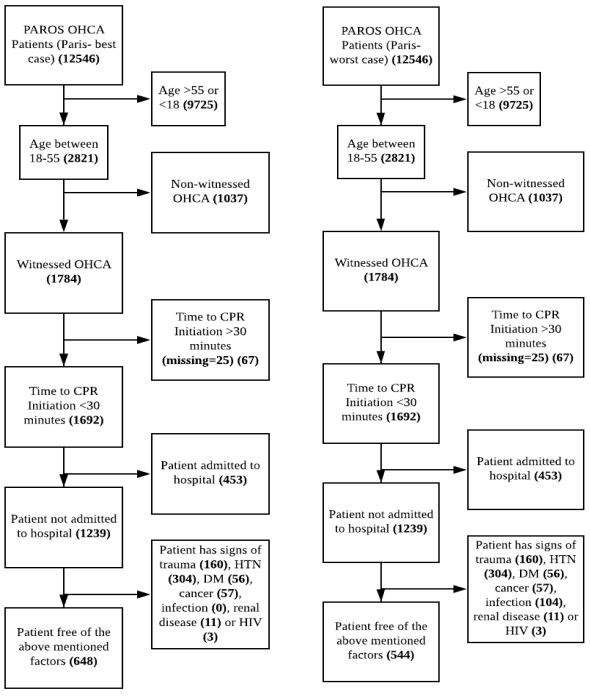


Figure 2.1. Application of Paris criteria.
PAROS, Pan-Asian Resuscitation Outcomes Study; *OHCA*, out-of-hospital cardiac arrest.

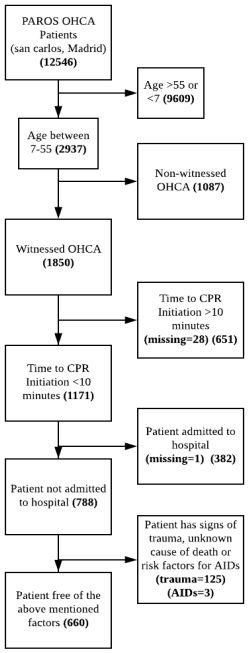


Figure 2.1. Application of San Carlos Madrid criteria.

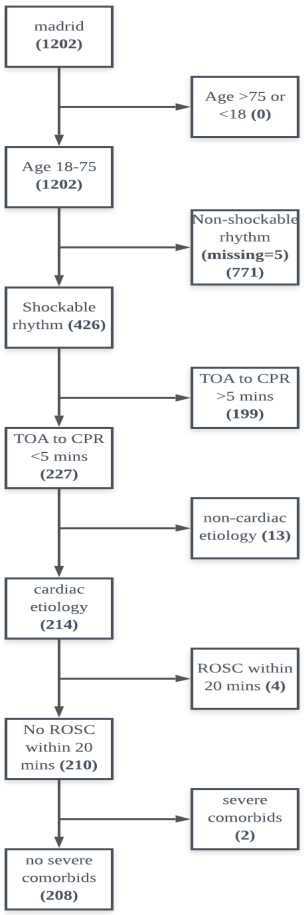


Figure 3.1. Application of condensed ECPR criteria (Madrid).

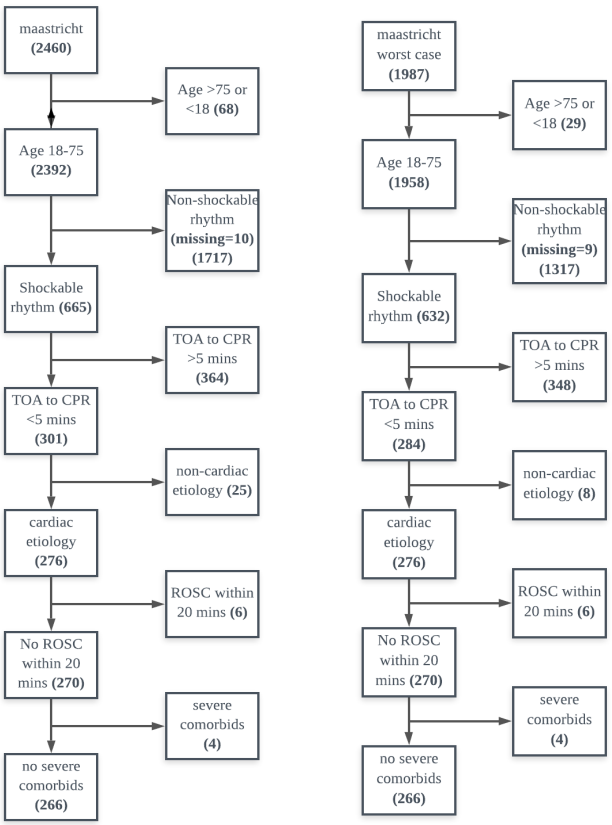


Figure 3.1. Application of condensed ECPR criteria (Maastricht).

ECPR, extracorporeal cardiopulmonary resuscitation; *ROSC*, return of spontaneous circulation.

Figure 3.1. Application of condensed ECPR criteria (Paris).

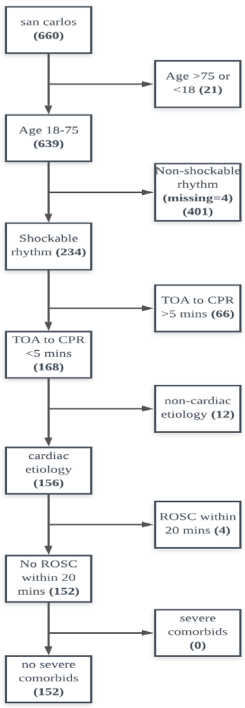


Figure 3.1. Application of condensed ECPR criteria (San Carlos, Madrid).

Table 4.1. Number of possible survivors among eligible organ donors.

	Madrid	San Carlos	Maastricht	Maastricht WC	Paris	Paris WC
Total	1202	660	2460	1987	648	544
Number of patients eligible for ECPR	208	152	266	266	102	102
(%)	17.3	23.0	10.8	13.4	15.7	18.8
Number of survivors	25.6	18.7	32.7	32.7	12.5	12.5
(%)	2.1	2.8	1.3	1.6	1.9	2.3

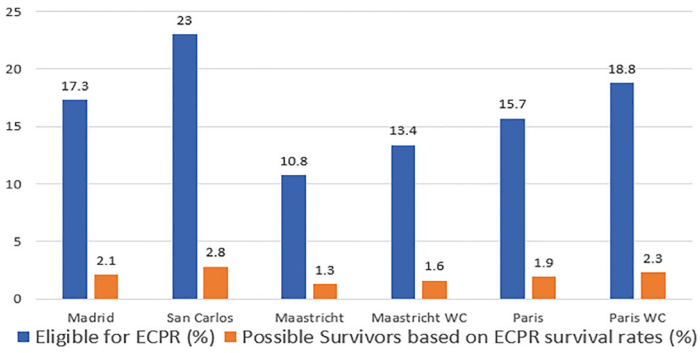


Figure 4.2. Percentage of possible survivors among eligible organ donors.
ECPR, extracorporeal cardiopulmonary resuscitation.

6 Intern Self-Reported Preparedness for Residency: An ACGME Milestone-Based Study

McLean ME[1], Huls TA,[1], Park JC,[1], Anana MC[2], Chen AS[3], Chien GK[4], Cygan L[5], Gupta SJ[6], Husain A,[7], Mishra D [8], Ng KM[9], Russell JT[10], Surles RT[11], Kulkarni ML[1] / [1]St. John's Riverside Hospital, Department of Emergency Medicine, Yonkers, NY; [2]Rutgers New Jersey Medical School, Department of Emergency Medicine, Newark, NJ; [3]Icahn School of Medicine at Mt. Sinai, Department of Emergency Medicine, New York, NY; [4]Jacobi-Montefiore Emergency Medicine Residency, Department of Emergency Medicine, Bronx, NY; [5]NewYork-Presbyterian Brooklyn Methodist Hospital, Department of Emergency Medicine, Brooklyn, NY; [6]Maimonides Medical Center, Department of Emergency Medicine, Brooklyn, NY; [7]Staten Island University Medical Center, Department of Emergency Medicine, Staten Island, NY; [8]NewYork-Presbyterian Hospital Weill Cornell/Columbia, Department of Emergency Medicine, New York, NY; [9]New York University Bellevue Hospital, Department of Emergency Medicine, New York, NY; [10]Lincoln Medical and Mental Health Center, Department of Emergency Medicine, Bronx, NY; [11]State University of New York Downstate/Kings County, Department of Emergency Medicine, Brooklyn, NY

Objective: Transitioning from medical school to internship is challenging. While several curricula for medical students and interns have been proposed during this transition period, there has not been a large-scale self assessment of incoming emergency medicine (EM) interns' preparedness for EM milestones. While many medical schools and EM residencies host "boot camps" or other intensive orientation programs for EM-bound students, having knowledge of incoming EM residents' self-perceived strengths and weaknesses will help clerkship directors and EM residency leadership better serve this group of learners.

Milestones in EM are used in the United States to measure residents' progress and determine competence at residency completion.[4] Incoming interns are expected to have achieved level 1 milestones by the time they enter residency, to have achieved level 2 milestones between the first and second year, and to have achieved level 4 milestones before completion of residency. We reached out to 151 newly- matched interns at 11 different sites to ask about their self-perceived "preparedness" for levels 1, 2, and 3 of our eight selected EM milestones (numbers 1, 3, 4, 5, 7, 9, 10, and 12).

Design and Method: This was a prospective, cross-sectional study of 151 newly-matched pre-interns at 11 EM residency programs. We included all newly-matched interns at each program. Interns were invited via email from their programs to complete a voluntary, anonymous survey prior to the start of residency. The survey used a Likert scale (1 = very unprepared to 5 = extremely prepared) to assess self-reported preparedness to perform levels 1 and 2 of milestones 1, 3, 4, 5, 7, 9, 10, and 12. Milestones were chosen based on ease of teaching in an EM case curriculum that was later implemented.

Results: A total of 126 pre-interns completed the survey (response rate 83.4%). Mean and standard deviation values are reported in Figures 1 and 2].

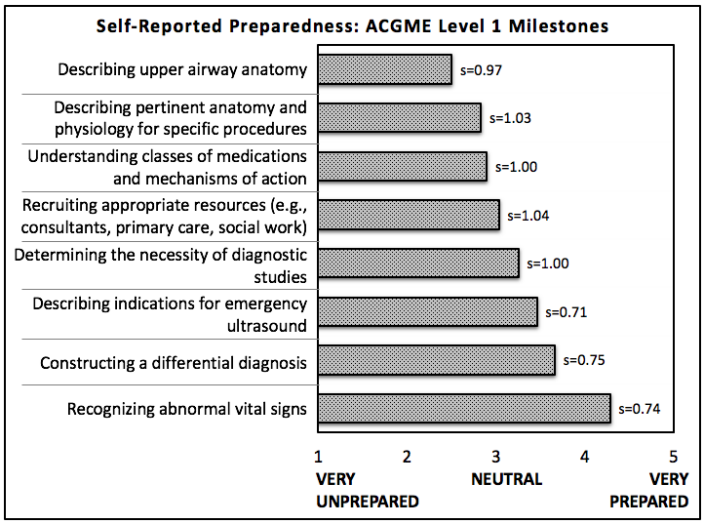
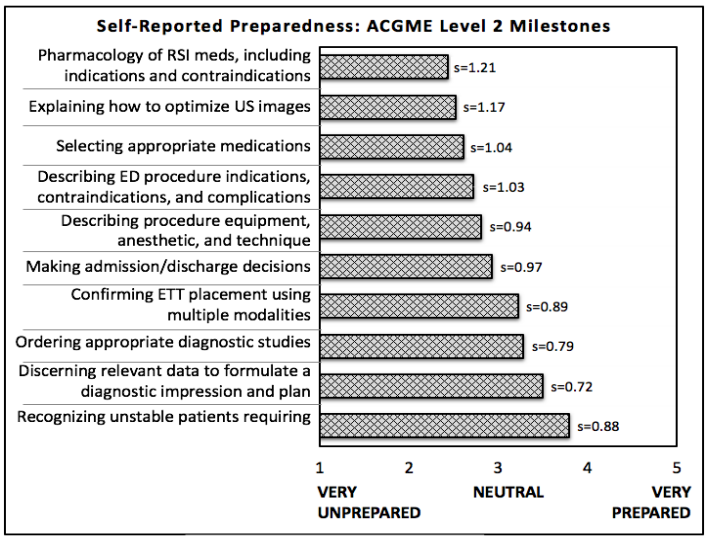


Figure 1. Self-reported intern preparedness to perform level 1 emergency medicine Milestones, using a Likert scale (1 representing "very unprepared" and 5 representing "very prepared"). Standard deviation is represented by "s."



ACGME, Accreditation Council for Graduate Medical Education; *ETT*, endotracheal tube.

Conclusion: Subjects reported highest level of preparedness for emergency stabilization (PC1), and lowest levels of preparedness for airway management (PC10) and pharmacological management (PC5). The data suggest that teachers of fourth-year medical students and new EM interns may want to emphasize milestones 5 and 10 early in internship or late in medical school.

7 A Study of the Korea Triage and Acuity Scale Using National Emergency Department Information System Analysis

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Introduction: The Emergency Severity Index plays an important role in the initial evaluation and treatment of emergency patients. In 2016, Korea initiated the KTAS (Korean Triage and Acuity Score) system in emergency departments (ED) nationwide. If its usefulness is verified, KTAS will be extended to the prehospital setting, which we believe will improve the nation's emergency medical services (EMS) system.

Methods: This is a retrospective study that uses the National Emergency Department Information System (NEDIS) database. From January - December 2016, we used NEDIS data from patients who visited EDs nationwide. We looked to verify the usefulness of KTAS on the KTAS distribution for Modified Early Warning Score (MEWS), length of stay in ED, and admission duration. We also analyzed KTAS in various conditions to determine the current status of KTAS.**Results:** A total of 5,506,071 patients were enrolled in the study. The KTAS distribution according to the MEWS score shows that the score of the first grade is the highest (8.5 ± 3.6), and the score decreases significantly as it goes down to the second, third, fourth, and fifth grades. And the fifth grade showed the lowest (2.3 ± 2.2). Considering that MEWS is a useful tool for emergency physicians to measure the hospitalization and mortality rate of patients, this indicates that KTAS is a useful tool for severity classification.

Conclusion: KTAS is an effective tool for classifying the severity of injury or illness of ED patients. We believe KTAS will improve the Korean EMS system nationwide.

8 Multi-Institutional Implementation of the National Clinical Assessment Tool in Emergency Medicine

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Objective: The National Clinical Assessment Tool in Emergency Medicine (NCAT-EM) was created at a consensus conference in 2016, and has been adopted within emergency medicine (EM) clerkships across the United States (U.S.). The objective of this study was to collect reliability and validity evidence from multiple sites. We analyzed and described score distributions, effects of student and evaluator characteristics, and rating tendencies of specific institution and evaluator types.

Design: Clerkship directors were recruited from geographically and academically diverse sites across the U.S. Each institution used NCAT-EM for assessment of their students' clinical performance and collected demographic data on students and assessors. A secure online database was developed that allows users to assign unique identifiers for students and assessors, and to enter de-identified demographic and NCAT-EM data.

Method: We performed descriptive statistics by site, clerkship type, and demographic group; and we also performed reliability, internal consistency, and factor analysis. The study was approved by the University of Arizona Institutional Review Board (IRB). All participating sites either underwent individual IRB review and approval, or ceded review to the University of Arizona.

Results and Conclusion: Thirteen sites input data on 748 students from 704 assessors, from 6402 discrete assessment forms. All subcategories on all ratings scales were used, as were all professionalism subdomains. There was a significant "right shift" of entrustability domains and global assessment, similar to other commonly used assessments. Professionalism lapses were noted on <1% of forms. All sites had a Cronbach's alpha >0.8; however, factor analyses revealed significant inter-institutional variability. We found no differences in scores by gender. There was an increase in scores in fourth-year compared to third-year medical students, but no significant increase in students' scores on subsequent rotations. While we found differences in assessor scores based on faculty rank and resident training year, there were no differences by years in practice.

This study is the first large-scale implementation of a consensus-derived, specialty-specific clinical assessment tool for medical students in the U.S. Analysis across multiple diverse settings allows for rigorous assessment of reliability and validity. This benefits all stakeholders. Students receive more accurate and useful feedback on their performance, clerkship directors can assign grades and rankings with greater confidence, residency programs can compare students across institutions, and ultimately patient safety is ensured through improved competence of providers.

9 Public Health in Acute Care Settings: Acute HIV in Six Urban Emergency Departments

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Background and Objective: Emergency departments (ED) play a critical role in acute care delivery and are at the interface of the community and the medical system. Some have capitalized on this role by implementing public health initiatives, such as human immunodeficiency virus (HIV) screening. Lab-based, fourth-generation testing detects acute HIV infection (AHI) when patients are highly infectious, may have symptoms, and often are unaware of exposure.

We describe newly diagnosed HIV from EDs across the U.S. with focus on the prevalence of AHI and the proportion of AHI among all newly diagnosed.

Methods: We collected data from six urban EDs in geographically distinct areas that have implemented HIV screening algorithms using fourth-generation testing capabilities. Data was aggregated to determine the total number of HIV tests performed, new HIV diagnoses and number of AHI. We defined AHI based on a reactive HIV Ag/Ab assay, negative HIV ½ antibody differentiation test, and detectable HIV-1 RNA.

Results: During the study period ending December 31, 2015, 159,102 HIV Ag/Ab tests were performed. In total, 2100 patients were identified with HIV; 605 (0.38%) were new HIV diagnoses, of which 98 (16.3%) were AHI. Total prevalence of AHI was 0.06%, and the percentage of newly diagnosed HIV that were AHI ranged from 13.1%-55.6% in the six EDs.

Conclusion: EDs are the central component of the acute care delivery system in the U.S. The percentage of AHI among ED patients is likely secondary to these patients seeking care for symptoms attributable to AHI and provides a valuable opportunity for early interventions.

10 Predicting Admission at Triage: Comparison of the Sydney Triage to Admission Risk Tool (START) and the Glasgow Admission Prediction Score (GAPS)

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Introduction: Emergency departments (ED) are the units where patient flow is intense, fast, and accurate. In recent years because of increased ED intensity, patient management became more complicated, patient satisfaction decreased, and emergency service expenditures increased. Current triage systems can predict the urgency of patients' needs but cannot predict hospitalization requirements. In this study we evaluated two established clinical scores, the Glasgow Admission Prediction Score (GAPS) and the Sydney Triage to Admission Risk Tool (START), for hospitalization predictions and compared them for superiority in predicting hospitalization requirements.

Methods: In this prospective observational study, all patients admitted to the Akdeniz University Hospital Emergency Department adult triage area between June 1-8, 2018, were evaluated. We calculated GAPS and START scores of patients during triage, and then patients were checked for their final management in the ED if they were hospitalized or discharged. The ability of both scoring systems for predicting hospitalization were calculated. We analyzed these comparisons with area under the receiver operating characteristic curve (AUC) values.

Results: A total of 2117 patients were enrolled to the study and 236 (11.1%) were hospitalized. The AUC value of GAPS was 0.894 (95% confidence interval [CI], 0.881 to 0.907) and the AUC value of START was 0.819 (95% CI, 0.801 to 0.835). The prediction of admission was high for both scoring systems; however, GAPS was a significantly better predictor for admission than START ($p<0.0001$).

Conclusion: In predicting hospitalization during triage in ED evaluation, both GAPS and START could be used; however, GAPS is a better predictor for hospital admission than START.

11 Implementing a Social Media-Based Curriculum for Newly-Matched Interns

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Objective: Transitioning to emergency medicine (EM) internship from medical school can be difficult. While prior investigations have evaluated pre-graduation or early internship boot camps to ease the transition, there is no previously described curriculum for the time between Match Day and start of internship. To address this gap, we designed a curriculum to be administered using the social media platform Slack. With our Slack curriculum, newly-matched interns can refresh their clinical knowledge before internship with collaborative learning via clinical cases. Our objective was to test the hypothesis that the Slack curriculum would increase the self-reported comfort of newly-matched interns with several EM learning objectives.

Design and Method: This was a prospective, observational study at St. John's Riverside Hospital, Northwestern University, and Rutgers New Jersey Medical School EM residency programs. The population was newly-matched EM interns, with no exclusion criteria, and participation was voluntary. The curriculum is published at (https://jetem.org/socialmedia_inn/). Subjects completed a

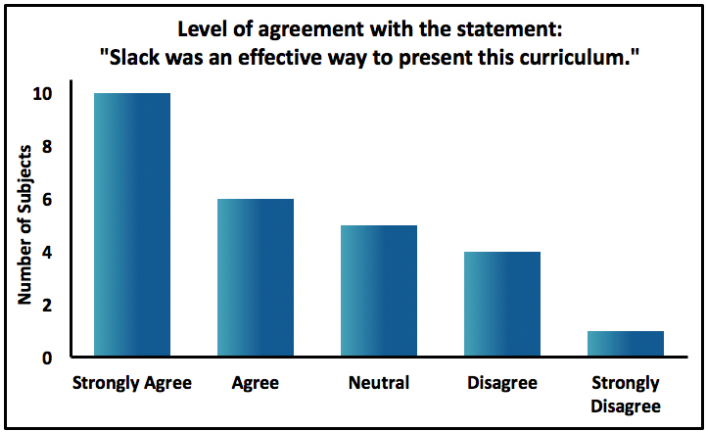
pre-survey assessing comfort with several aspects of EM. The curriculum was implemented between Match Day and the first day of internship in 2018. Interns completed a post-survey that re-assessed comfort and elicited feedback on the curriculum.

Results: All 36 interns completed the pre-survey and 26 completed the post-survey (Table1). Participants reported a statistically significant increase in comfort with identifying airway anatomy and physiology ($p = 0.01$). Mean comfort increased, but was statistically significant for all other objectives. Sixteen of 26 post-survey participants agreed that Slack was an effective way to present the curriculum, and only five disagreed (Figure1).

Conclusion: When presented prior to the start of residency, the curriculum significantly increased self-reported intern comfort with one EM learning objective. A majority of interns felt that Slack was an effective way to present the curriculum. Limitations included small sample size, possibly hindering detection of statistically significant changes. Interns who found the curriculum less useful may have been less likely to complete the post-survey. This study was not designed to measure improvements in clinical knowledge. Future directions will address these issues.

Table 1. Comparison of the Means Pre- and Post-Utilization of Slack Curriculum. Means based on Likert scale ratings 1-5, with 1 being least and 5 being most comfortable.

Assessed Aspect of Emergency Medicine	Pre-Slack Mean	Post-Slack Mean	Difference	Standard Error	T-Value	95% CI	P-Value
Determining Necessity of Diagnostic Studies	3.56	3.85	0.29	0.20	1.45	3.43−4.26	0.16
Interpreting Radiographs	3.39	3.39	0.00	0.23	-0.18	2.91−3.86	0.99
Interpreting Ultrasounds	2.81	3.15	0.35	0.26	1.33	2.61−3.70	0.20
Interpreting CT Images of Head	3.06	3.35	0.29	0.27	1.08	2.79−3.90	0.29
Constructing a Differential Diagnosis	3.92	4.04	0.12	0.15	0.84	3.74−4.34	0.41
Identifying Airway Anatomy and Physiology	2.86	3.65	0.79	0.27	2.99	3.11−4.20	0.01
Describing Basic Biostatistic Principles	2.75	3.08	0.33	0.30	1.09	2.46−3.70	0.29



12 Which Wellness Activities Correlate with Lower Resident Physician Burnout?

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Objective: Studies show a high burnout level among resident physicians. Many different activities have been recommended to improve burnout. Researchers also describe the importance of culture and work efficiency in employee wellness. This study aimed to evaluate the correlation between resident burnout and various wellness activities.

Design and Methods: Each year, the University of Kansas Medical Center Graduate Medical Education Wellness Subcommittee administers a wellness survey to all 560 residents and fellows. The 71-question, electronic survey, which was originally developed at Stanford University Medical Center, received institutional review board approval.

Results: Of the 560 residents who received the survey 393 (70% response rate) completed it, including 147 female residents (37%) and 246 males (63%). The overall resident burnout rate was 20.4%. Sixteen emergency medicine residents completed the survey with a reported burnout rate of 37.5%. Several activities and program attributes correlated with statistically lower resident burnout. Survey results indicated the following: 258 of 383 residents regularly engaged in hobbies outside of work (burnout 15.5% vs 31.2%, chi square p value = 0.0004); 294 out of 381 regularly scheduled protected time with partner/family/friends (burnout 17.4% vs 32.2%, p value =0 .0027); 329 of 379 felt their residency programs had a supportive culture with respect to wellness (burnout rate of 15.2% vs 54%, p-value = <0.0001); and 232 of 388 responded that it was "very true" or "completely true" that their residency programs engaged in initiatives aimed at improving the efficiency of their healthcare delivery (burnout rate of 11.2% vs 40.0%, p-value = <0.0001). Residents who regularly engaged in physical activity more often than once per week trended toward lower burnout (burnout rate of 17.7% vs 32.8%, p value = 0.14). Practicing meditation/mindfulness or considering oneself to be a spiritual person did not correlate with lower burnout in our survey.

Conclusion: Our study demonstrates evidence of several factors that may be protective against resident physician burnout. These findings are important for emergency physicians, who typically suffer from higher burnout than other specialties. Leaders of academic emergency departments should ensure that they foster a supportive culture, undertake initiatives to improve efficiency, and empower their resident physicians to protect time outside of work and engage in activities that increase wellness.

13 Impact of Endotracheal Tube Twisting on the Diagnostic Accuracy of Ultrasound for Intubation Confirmation

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Objective: Successful intubation in the emergency department relies on rapid and accurate confirmation of endotracheal tube (ETT) placement. An unrecognized esophageal intubation can delay effective resuscitation of critically ill patients and those in cardiac arrest. Ultrasound has been used as a tool to identify tracheal or esophageal location of an ETT. Imaging can be visualized in a static manner or assisted by performing a side-to-side "twisting" maneuver of the tube directly after intubation to induce motion artifact. However, no prior studies have determined whether ETT twisting improves diagnostic accuracy. The objective of this study was to investigate the effect of the twisting technique on the use of ultrasound for intubation confirmation.

Methods: Ultrasound exams were performed on two cadavers with varying neck circumference. Cadavers were randomized to either esophageal or tracheal intubation. Ultrasound examinations were performed by three sonographers blinded to the location of the ETT. Sonographers were instructed to either gently twist the ETT side-to-side or avoid any ETT movement during the examination. We recorded accuracy in the identification of ETT location, the time it took to perform the exam, and operator confidence.

Results: A total of 540 intubations were performed, with 270 tracheal intubations (Figure1) and 270 esophageal intubations (Figure2). Each was assessed with both static and ETT twisting techniques. Ultrasound was 97.8% accurate (95% confidence interval [CI], 95.2% to 99.0%) using the static imaging technique and 100% accurate (95% CI, 98.6-100%) in the ETT twisting group. The mean time to ETT identification was significantly longer in the static group (6.87 seconds [s] [95% CI, 6.30 to 7.44 s) as compared to the ETT twisting group (4.97 s [95% CI, 4.36 to 5.57 s]). The mean operator confidence level was significantly lower with the static technique [4.71/5.0 (95% CI, 4.63 to 4.78)] as compared to the twisting technique [4.84/5.0 (95% CI, 4.79 to 4.90)].

Conclusion: The diagnostic accuracy for ultrasound-assisted identification of ETT location was similar when using the static and ETT twisting techniques. However, the twisting maneuver resulted in shorter time to identification of tube location and increased operator confidence compared to the static ETT technique.

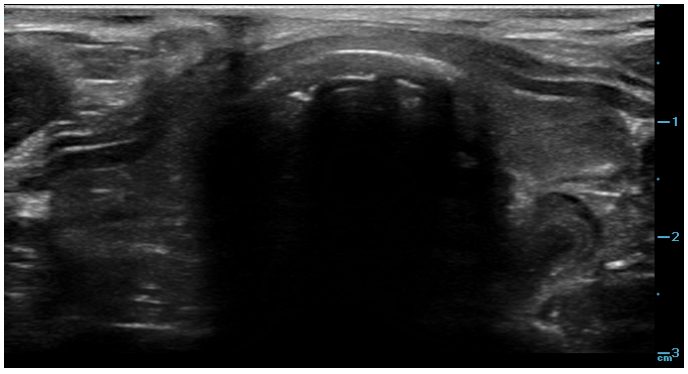

Figure 1. Endotracheal intubation.

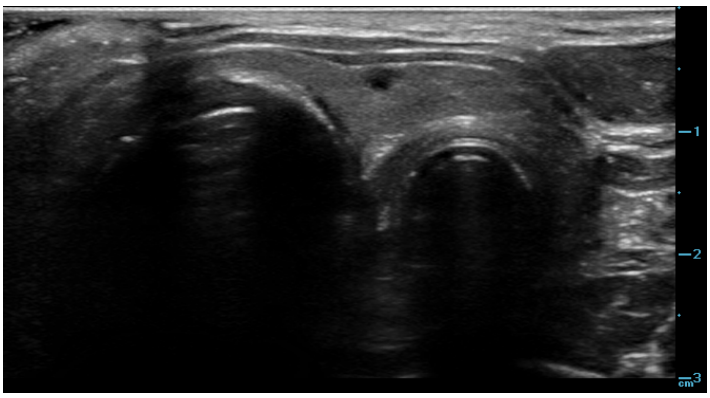

Figure 2. Esophageal intubation.

14 Impact of Universal Non-Targeted Hepatitis C Screening in an Urban Emergency Department

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Objective: The Centers for Disease Control and Prevention recommends hepatitis C virus (HCV) screening for adults born between 1945 - 1965 and for those who have engaged in high-risk activities. While not recommended, universal, non-targeted screening may be a more ideal approach to reach vulnerable, high-risk populations in the emergency department (ED).

Design and Method: A program evaluation of universal, non-targeted HCV screening was conducted on patients presenting to an urban ED between June 6 - November 27, 2018. All adults 18 and older were offered HCV testing during initial nursing engagement. Patients who declined the nurse testing offer were re-engaged by health educators to encourage testing. Reactive HCV Ab tests were reflexed to viral load (VL). Patients found to be VL+ were linked to care.

Results: During the evaluation period, there were 40,679 ED visits representing 23,857 unique adult patients. Nurse testing offer responses were as follows: 16,573 (70%) declined testing; 4421 (19%) accepted testing; 309 (1%) were known HCV+; 1187 (5%) lacked capacity to consent,;758 (3%) had a life-threatening emergency; 451 (2%) responses were categorized as "other." Of those who accepted the nurse offer of testing, most (92%) had an HCV test performed. Of those who had declined the nurse offer, 6% had an HCV test performed. HCV tests were also performed on 11% of patients known to be HCV+, 4% of those who initially lacked capacity, 4% of those who initially presented with a life-threatening emergency, and 11% whose initial response was categorized as "other." In total, 5270 HCV Ab tests were performed of which 94.3% (4,970) were non-reactive and 5.7% (300) were reactive. One-third of reactive HCV Ab tests were VL+ (100), 54% (162) were VL-, and 13% (39)

were categorized "quantity not sufficient." Of those tested 44% were male, 20% were White, 20% Black, 6% Asian, and 54% other. Most had Medicaid (41%) Medicare (20%) or commercial insurance (22%). A minority (16%) were uninsured. Risk-factor information was collected on 157 of 300 patients (52%) with reactive HCV Ab tests of whom 23% had no identified risk factors. Targeted HCV screening based on risk factors and age would have missed 4% (12/300) of those with a reactive Ab test and 4% (4/100) of those with a positive VL.

Conclusion: Universal, non-targeted HCV screening identified a large number of patients with HCV (6% prevalence) and viremia (1.8% prevalence). Targeted screening would have missed a small but significant number of patients with active infection.

15 Impact of Trauma Levels on Survival of Patients Arriving with No Signs of Life to U.S. Trauma Centers

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Objective: Trauma level designation and verification are examples of healthcare regionalization aimed at improving patient outcomes. This study examines the impact of trauma levels on survival of patients arriving with no signs of life to trauma centers in the United States.

Design and Method: This retrospective study used the U.S. National Trauma Data Bank (NTDB) 2015 dataset. We performed a descriptive analysis followed by a bivariate analysis comparing variables by the trauma designation levels. A multivariate analysis assessed the effect of the trauma designation on survival to hospital discharge after controlling for potential confounding factors.

Results: We included 6160 patients without signs of life. The average age was 40.66 years (±19.96) with male predominance (77.3%). Most patients were transported using ground ambulance (83.5%) and were taken to Level I (57%) and Level II (32.4%) trauma centers. Blunt injuries were the most common (56.9%). Motor vehicle transport (38.5%) and firearm (33.8%) were the most common mechanisms of injury. Survival to hospital discharge among patients with no signs of life ranged from 13.7% at Level I to 27.9% at Level III. After adjusting for confounders, including the Injury Severity Score (ISS), higher survival was noted at Level II compared to Level I trauma centers.

Conclusion: Patients presenting without signs of life to Level II trauma centers had higher survival to hospital discharge compared to Level I and Level III centers. These findings can guide future prehospital triage criteria of trauma patients in structured emergency medical services (EMS) systems and highlight the need for more outcome research on trauma systems.

16 Safety And Efficacy of Prehospital Paramedic Administration of Ketamine In Adult Civilian Population

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Objective: Opiates are addicting and have a high potential for dependency. Opiate-related overdoses now claim 130 American lives each day, and the opiate epidemic costs nearly $80 billion annually. In past decades, opiates were a mainstay of prehospital treatment for acute traumatic pain in the civilian population. Ketamine is a N-methyl-d-aspartate receptor antagonist that has analgesic properties and may serve as an alternative agent for the treatment of acute traumatic pain in the prehospital setting. This study aimed to assess the safety and efficacy of ketamine administration by paramedics in a civilian prehospital setting for the treatment of acute traumatic pain.

Design and Method: This was a prospective, observational study conducted in the counties of San Bernardino, Riverside and Stanislaus in the state of California. The inclusion criteria were patients > 15 years of age with complaint of traumatic or burn-related pain. We excluded patients if they had received opiates prior to or concurrently with ketamine administration. Dose administered was 0.3 milligrams per kilogram (mg/kg) intravenously over five minutes with maximum dose of 30mg. Option to administer a second dose was available to paramedics if the patient continued to have pain after 15 minutes following the first administration. We conducted paired-T tests to assess the change in the primary outcome (pain score) and secondary outcomes (eg, systolic blood pressure [SBP], respiratory rate, and pulse). P value <0.05 was considered to be statistically significant.

Results: We included 368 patients in the final analysis. The average age was 52.9 ± 23.1 years old, and the average weight was 80.4 ± 22.2 kg. There was a statistically significant reduction in the pain score (9.13 ± 1.28 vs 3.7 ± 3.4, delta = 5.43 ± 3.38, p<0.0001). Additionally, there was a statistically significant change in SBP (143.42 ± 27.01 vs 145.65 ± 26.26, 2.22 ± 21.1, p = 0.0440), pulse (88.06 ± 18 vs 84.64 ± 15.92, delta = -3.42 ± 12.12, p<0.0001), and respiratory rate (19.04 ± 3.59 vs 17.74 ± 3.06, delta = -1.3 ± 2.96, p<0.0001).

Conclusion: This study suggests that the administration of a subdissociative dose of ketamine by paramedics in the

prehospital setting is an effective analgesic in selected adult trauma patients. Additionally, ketamine did not demonstrate the adverse effects (eg, respiratory failure or hypotension) typically seen in opioid administration.

17 Prognostic Factors of Poor Outcome in Geriatric Traumatology Patients in the Emergency Department

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Background and Objective: Identification of elderly trauma patients who are likely to have poor outcome may help the emergency physician to provide better management. We sought to evaluate the current management of geriatric traumatology patients in our emergency department (ED) and to identify the prognostic factors of poor outcome in elderly traumatic patients.

Design and Methods: We conducted a retrospective study in an ED over a period of one year, based on file analysis of 768 trauma elderly patients. We included all patients older than 65 years admitted to the ED after a fall, and we excluded critical patients Epidemiological, clinical, biological, therapeutic, and evolution criteria were collected. We defined poor outcome by mortality at day 28, and we used multivariate logistic regression to obtain the probability of a death at 28 days.

Results: We enrolled 768 patients in the study. Mean age was 78 years [71-85], and the gender ratio was 2.07. Comorbidities included the following: hypertension N = 426 (23%); dyslipidemia N= 257 (14%); diabetes N = 150 (9%); osteoporosis N= 136 (8%); prosthetic orthopedic equipment N = 124 (7%); history of fall N = 139 (8%); dementia N=138 (7%); and depression N=138 (7%). Of the cases involving falls, 67% were of less than two meters. We found that 76.87% of the population took at least three medications. The over-all mortality was 2.2% with 11 patients dead at day 28.

We performed a univariate logistic regression to select the best predictors of mortality at 28 days, which were reduced to three in multivariable logistic regression: the C-reactive protein (CRP) test with an odds ratio (OR) at 1.01 and confidence interval (CI) 95%, 1.00 – 1.01, p = 0.05; the Index Severity Score (ISS) face with an OR at 2.24 and CI 95%, 1.12 – 4,47, p = 0,02; and the hospitalization rate with an OR at 1.71 and CI 95%, 1.07 – 2.72, p = 0.02.

Conclusion: CRP, the ISS face, and being hospitalized appear to predict poor outcome in elderly traumatic patients admitted in the ED. Future prospective and multicentric studies are needed to validate these findings.

18 Can Prehospital Personnel Accurately Triage Patients for Large Vessel Occlusion Strokes?

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Objective: The Field Assessment Stroke Triage for Emergency Destination (FAST-ED) score has been shown to have a higher predictive value compared to the National Institutes of Health Stroke Scale (NIHSS) to identify large vessel occlusion strokes (LVOS). The study suggested that patients with a score of 4 or greater should be taken directly to a comprehensive stroke center where endovascular intervention is available rather than to the closest emergency department (ED). However, the score in this study was assessed when a stroke patient had already arrived at the hospital. To date, no study has been done to validate using the FAST-ED score in the prehospital setting. Our study compares prehospital FAST-ED scores with FAST-ED scores done by emergency medicine senior resident or attending physicians when patients arrive in the ED.

Design and Methods: Miami-Dade County emergency medical services (EMS) personnel were trained to calculate a FAST-ED score for any patient suspected of having an ischemic stroke or transient ischemic attack in the field (EMS FAST-ED). When the patient arrived in the ED of a comprehensive stroke center a physician completed a FAST-ED score (ED FAST-ED). Both numbers were recorded. Imaging was taken in accordance with hospital stroke guidelines. We excluded from the study intracranial hemorrhages seen on the non-contrast brain computed tomography. LVOS were defined as complete or partial occlusion of the internal carotid artery, middle cerebral artery, and basilar artery.

Results: We studied 130 patients whose ages averaged 73.2±18 years. LVO was detected in 28 of 130 patients (22%). There were no differences between the medians for EMS FAST-ED scores (3 [interquartile ratio (IQR) 1-4.25]) and the medians for the physician-generated scores (4 [IQR 1-6); p = 0.696, Mann-Whitney U test.). Further, the median of the differences between the individual EMS and the ED scores were not different from zero (median for the differences = 0 [IQR -1, 2]; p = 0.67, Wilcoxon signed-rank sum test). In addition, EMS FAST-ED scores were strongly correlated with the physician FAST-ED scores ($r^2 = 0.26$; $p<0.001$).

For scores ≥4 EMS FAST-ED had a sensitivity of 0.57 and a specificity of 0.70, and ED FAST-ED scores had a sensitivity of 0.68 and a specificity of 0.72. The area under the receiver operating characteristic curve for EMS was

0.617±0.13 and for the ED was 0.623±0.13. The Youden's index for these tests was 0.33 for physicians' scores and 0.22 for EMS scores.

Conclusion: Although this work is based on a small sample, the findings suggest that FAST-ED scores assessed by prehospital personnel were not different from those obtained by physicians at the ED. The FAST-ED score between the two groups had a comparable sensitivity, specificity and accuracy for predicting LVOS.

19 Comprehensive Approach to Sustainable Reduction in Emergency Department Opioid Prescribing

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Objective: Despite the strict regulation of opioids, the majority of individuals who develop opioid use disorder are introduced to opioids through prescription pain medication. While emergency physicians contribute minimally to the overall number of opioid prescriptions, they treat a high volume of patients with painful conditions and are often at least the initial prescriber of opioids for such patients. The present quality improvement (QI) project aimed to decrease the rate of opioids administered in the emergency department (ED) and prescribed at discharge.

Design and Method: The QI project consisted of three distinct interventions: 1) monthly non-anonymous feedback to all providers regarding their opioid prescription patterns compared to the provider group; 2) removal of hydromorphone from the decentralized, automated, medication dispensing system; and 3) addition of an "Alternative to Opioids" order set to the computer provider order-entry system. The intervention spanned a four-month period from October 2018 to January 2019 in a 27-bed community hospital ED that sees about 50,000 patients annually. We compared opioid administration and prescription to the same months in the preceding year to account for seasonal variation.

Results: There were 12,897 patient-visits in the pre-intervention period compared to 12,372 in the post-intervention period. The normalized morphine milligram equivalents (MME) administered and prescribed per patient decreased 32.3% from 10.2 to 6.9. The average MME of opioids administered before and after the intervention (12.6 vs 12.9, p = 0.33) or prescribed for outpatient therapy (72.6 vs 69.1, p = 0.11) did not differ. The exposure of our community to opioids was reduced by 45,800 MME over the study period.

Conclusion: The intervention produced a significant and sustained reduction in the administration and prescription of opioids. The average dose administered did not differ, suggesting that patients who required opioid pain control were not undertreated. Fewer individual patients were exposed to opioids as part of their treatment, theoretically decreasing the risk of dependence, abuse, and addiction. The intervention required minimal resources to implement and is easily scalable to a variety of settings.

20 Telephone Follow-Up After Pediatric Emergency Department Discharge – Does It Impact the Likelihood of Return Visits?

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Background: Successful transitions of care from the pediatric emergency department (ED) to home can be impacted by comprehension of discharge instructions, medication adherence, and primary care follow-up. Post-discharge communication has been used to identify barriers to ongoing care after discharge. While follow-up calls after ED discharge have been associated with improved adherence and primary care follow-up, some research suggests a higher likelihood of return visits for patients called. In this study, we analyzed predictors of nurse-directed telephone follow-up after discharge from a pediatric ED and the rate of return visits.

Methods: We performed a retrospective cohort study of patients <19 years old discharged from an academic pediatric ED between 3/1/2015-8/31/2016. Staff nurses called discharged patients within 72 hours with a standardized survey to assess follow-up and symptoms. We used multivariate logistic regressions to evaluate relationships between patients called, those reached, and those not called, and 72-hour and seven-day return visits. These data were controlled for by age, insurance type, and race.

Results: Of the 25,152 patients discharged from the pediatric ED during this time period, 7378 (29%) had calls attempted; 4110 (16.3%) were reached and completed the survey. Patients reached were less likely to return in 72 hours compared to those not reached (2.6% vs 5.4%; adjusted odds ratio [aOR] 0.5; 95% confidence interval [CI], 0.40-0.59). Similarly, patients reached were less likely to return within seven days (6.0% vs 8.2%; aOR 0.71; 95% CI, 0.62-0.82) (Table 1). Few patients needed clarification on instructions

and few reported problems obtaining or taking prescribed medicines (Table 2).

Conclusion: Patients successfully reached by phone within 72 hours after discharge are significantly less likely to return for further ED care within 72 hours or seven days compared to patients who were unable to be reached or not called. While our data do not suggest clarifying instructions or assisting with medications helps, phone call may assist with reassurance leading to lower likelihood of return. Discharge follow-up communication via phone may be a useful method of targeting high-risk patient groups. In addition, recognizing that few patients needed clarification on instruction or significant assistance, automated methods of outreach may be more cost-effective for employment and maintenance.

Table 1. Patient demographics regarding telephone outreach after pediatric emergency department visit.

	Total discharges	Called		Reached (of attempted calls)	
		n	%	N	%
Total	25152	7378	29.3	4110	55.7
Age (Years)					
0-1	7492	2270	30.3	1274	56.1
2-5	7482	2205	29.5	1239	56.2
6-11	5596	1669	29.8	917	54.9
12-18	4582	1234	26.9	680	55.1
Sex					
Female	11743	3437	29.3	1890	55.0
Male	13408	3941	29.4	2220	56.3
Race					
Black	4166	1380	33.1	753	54.6
Asian	4019	1096	27.3	645	58.9
White	6603	2133	32.3	1139	53.4
Hispanic/ Latino	6487	1586	24.4	910	57.4
Mixed/Other	3369	1023	30.4	585	57.2
Unknown	508	160	31.5	78	48.8
Insurance					
Public	13437	3690	27.5	2125	57.6
Private	10939	3491	31.9	1895	54.3
Self-Pay	776	197	25.4	90	45.7
Median Income					
$14k-$70k	9374	2700	28.8	1561	57.8
$70k-$125k	13810	4096	29.7	2238	54.6
$125k+	1518	475	31.3	253	53.3
Unknown	450	107	23.8	58	54.2

Table 2. Successful telephone contact after visit to pediatric emergency department.

	Call Attempt		Call Success	
	OR	95% CI	OR	95% CI
Age (Years)				
12-18 vs 0-1	0.85	0.78-0.92	0.97	0.84-1.12
Race				
Black vs White	1.21	1.1-1.33	0.92	0.78-1.07
Asian vs White	0.83	0.76-0.91	1.2	1.03-1.39
Hispanic/ Latino vs White	0.76	0.7-0.83	1.09	0.94-1.25
Insurance				
Public vs Private	0.82	0.76-0.87	1.12	1.0-1.25
Uninsured vs Private	0.82	0.68-0.98	0.73	0.54-0.99

OR, odds ratio; *CI*, confidence interval.

21 The Impact of a Liaison Program on Patient Satisfaction in the Emergency Department

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Background and Objective: Improving patient satisfaction is paramount to a successful emergency department (ED). Individualized patient navigators can be useful in providing immediate service recovery, but they can be costly. A patient liaison program adapted to ED needs and flow may be able to elicit consistent, structured feedback and result in increased patient satisfaction ratings.

Methods: This quality improvement project was conducted in the ED of an urban, academic, community hospital. Trained patient experience liaisons engaged patients at multiple points during their ED course and administered a survey that elicited opportunities for immediate service recovery. Engaged patients who also completed a validated patient satisfaction survey (Quality Reviews, New York, NY) were case-matched 1:1 by age, gender and ED arrival time with patients who were not encountered by the patient advocate. Topics on the survey included wait times, cleanliness, overall experience, and "likelihood to recommend."

Results: This retrospective, case-control study included data from 400 participants. Patients in the intervention group had a significantly longer ED length of stay compared to the control group (4.7 hours vs 3.9 hours, $p = <0.001$). In the patient liaison-administered survey, 96.7% and 91.8% of individuals responded positively to

the "likelihood to recommend" and "cleanliness" questions, respectively; 54.4% of patients reported waiting less than 15 minutes to see a physician. Patients in the intervention group had significantly higher mean scores on the validated post-visit survey compared to controls on questions regarding "likelihood to recommend" (4.21, confidence interval [CI] 4.03-4.38 vs 3.82, CI, 3.61-4.02, p = 0.01), overall rating (4.16, CI 4.00-4.33 vs 3.87, CI 3.68-4.06, p = 0.04), waiting time for provider (4.11, CI, 3.92-4.31 vs 3.81, CI 3.61-4.00, p = 0.01), and department cleanliness (4.09, CI, 3.91-4.27 vs 3.80, CI, 3.62-3.98, p = 0.02) (Table1).

Conclusion: An ED-oriented patient liaison program allowed for real-time feedback and opportunities for immediate service recovery, resulting in increased patient satisfaction ratings across multiple indicators.

Table 1. Patient experience ratings and 95% confidence intervals for patients encountered by patient navigators vs case-matched controls.

	Control	Intervention	p-value
"Likelihood to recommend"	3.82 (3.61-4.02)	4.21 (4.03-4.38)	0.010*
Overall	3.87 (3.68-4.06)	4.16 (4.00-4.33)	0.039*
Wait time	3.81 (3.61-4.00)	4.11 (3.92-4.31)	0.012*
Cleanliness	3.80 (3.62-3.98)	4.09 (3.91-4.27)	0.016*

22 "Secure-Preserve-Fight" or "Run-Hide-Fight": Expectations of an Emergency Department Patient Population During an Active Assailant Event

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Objective: We sought to assess the opinions of a general emergency department (ED) patient-family population regarding healthcare providers' life-saving responsibilities during an active assailant event (the traditional "Run-Hide-Fight" paradigm [provider-centric] vs the novel "Secure-Preserve-Fight" [vulnerable patient-centric]) paradigm.

Design and Method: This institutional review board-approved study presented a scenario-based questionnaire to a convenience sample of ED patients and their retinues. Demographic information included prior military service, formal active-shooter training, and prior violent victimization. The randomly selected subjects evaluated four typical patient scenarios of varying severity within which an emergency physician/nurse was in immediate proximity. They were provided four responses addressing their expectations regarding the healthcare provider's actions: provider-centric (namely, "Run-Hide-Fight), or patient-centric (that is, Secure-Preserve-Fight). The frequency of each response was the primary outcome. We employed a non-parametric binomial test as well as SPSS (IBM, Chicago, IL)

Conclusion: For this particular ED population, a significant majority supported the patient-centric "Secure-Preserve-Fight" paradigm over the more provider-centric "Run-Hide-Fight" option. This lay public perspective should spur healthcare staff and administration to reconsider their current active shooter plans and possibly modify them to be consistent with "Secure-Preserve-Fight," especially when dealing with the vulnerable patient.

23 Burnout in Resident Physicians: Correlation with Mistreatment and Workplace Violence

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Background: Research studies show a high burnout level among physicians. Research also shows that mistreatment of medical trainees and workplace violence have potentially long-term, negative effects on the individual. This study examines the correlation between resident burnout and the self-reported incidence of mistreatment and workplace violence.

Methods: Each year, the University of Kansas Medical Center Graduate Medical Education Wellness Subcommittee administers a wellness survey to all 560 residents and fellows. The 71-question electronic survey was originally developed at Stanford University Medical Center. We obtained institutional review board approval for this study..

Results: Of 560 residents and fellows from various specialties who received the survey, 393 completed it (70% response rate); the responses included 147 from female residents (37%) and 246 from males (63%). We found that 20.4% of all resident surveys had responses indicative of burnout. Of the 16 emergency medicine (EM) residents who completed the survey, we found a 37.5% burnout rate. Overall, 35 residents reported being publicly humiliated, and they had a significantly higher burnout rate than those who did not (62.9% vs 16.9%; p value = <0.0001). We also found the following: 55 residents reported being publicly embarrassed, and they had a higher burnout rate than those who did not (52.6% vs 15.5%; p value = <0.0001); 23 residents reported being subjected to offensive sexist

remarks/names, and they too suffered higher burnout (47.8% vs 19.6%; p value = 0.0015). Finally, 89 residents reporting being verbally threatened at work in the prior year, and they had a higher burnout rate than those who had not been threatened (42% vs 14%; p value = <0.0001).

Summary: Our wellness survey confirms prior studies showing a high rate of burnout among resident physicians and among EM residents specifically. Our survey also confirmed an increased burnout rate associated with mistreatment and workplace violence. EM faculty should keep in mind the significant impact of embarrassment, humiliation, and sexism when interacting with residents who already work in a stressful environment in which there is a high risk of workplace violence.

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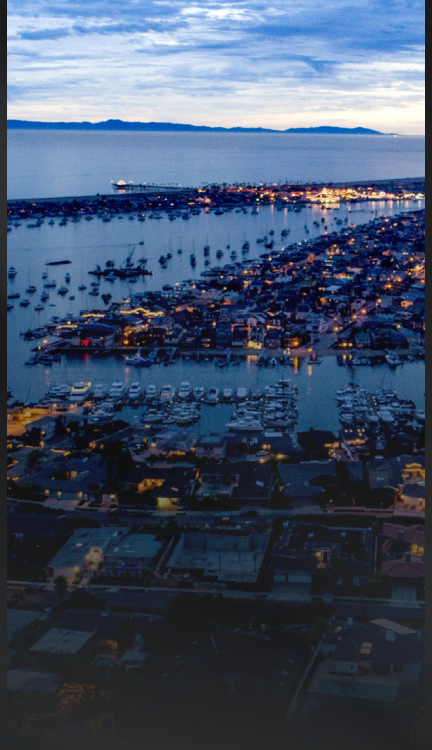

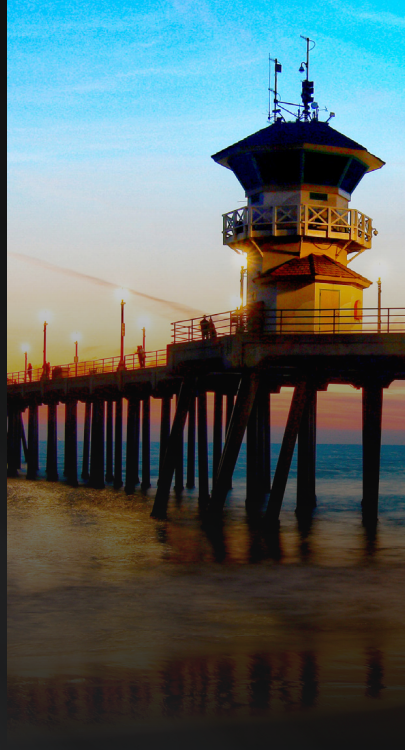

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