environment section. **Conclusions:** Human factors–based analysis of video recordings of actual ED work identified a variety of work system factors that impede appropriate or correct use of PPE by HCWs. Future efforts to improve appropriate PPE use should focus on eliminating or mitigating the effects of these work system factors.

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Work system barriers to & resilience strategies for COVID-19 PPE use in the emergency department: A qualitative interview study

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Background: Emergency departments (EDs) are complex, sociotechnical, high-paced, safety-critical work systems that have been disproportionately affected by the COVID-19 pandemic. Despite training, consistent compliance with recommended PPE use during COVID-19 pandemic has been challenging. Healthcare workers (HCWs) have had adapt to overcome these challenges to ensure their own safety and patient safety. We sought to identify barriers in the work system that impede the recommended COVID-19 PPE use in EDs. **Methods:** We conducted semistructured, in-depth interviews over ZoomTM from August 2020–May 2021 with 45 HCWs from the ED (ie, physicians, nurses, ancillary support staff, etc) affiliated with a large, tertiary-care, academic medical center. These audio-recorded interviews were transcribed and analyzed using a hybrid (inductive and deductive) qualitative coding approach in NVivo software. The deductive portion was guided by the SEIPS work system model, a well-known human-factors conceptual framework. **Results:** We identified multiple work-system factors in the ED that impede compliance with the recommended COVID-19 PPE use. In addition, ED HCWs have reported making a variety of adaptations or developing strategies to overcome these barriers. Some of these adaptations were made to the PPE physically (eg, trimming portions of PPE), and others were related to the tasks and/or processes associated with PPE, such as filming their own training video demonstrating PPE donning and doffing techniques, and environment services staff checking a patient's status with nurses prior to entering the patient's room when there was no COVID-19 signage on the door. **Conclusions:** Consistent compliance with COVID-19 PPE use in ED clinical practice is challenging and can be negatively affected by a variety of work system factors. Resilience strategies developed by HCWs can provide critical information with regards to HCW needs and potential directions for innovation. Future efforts should focus on not only changing individual HCW behavior through training but also on improving the PPE and ED work system design.

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Analysis of Universal admission laboratory screening for SARS-CoV-2 asymptomatic infection across a large health system

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Background: Admission laboratory screening for asymptomatic COVID-19 has been utilized to mitigate healthcare-associated SARS-CoV-2 transmission. A better understanding of the impact of such testing across a variety of patient populations is needed. **Methods:** Beginning April 2020, every patient admitted within an academic healthcare system underwent SARS-CoV-2 PCR testing upon admission. Between April 20, 2020 through June 14, 2021, results were analyzed in asymptomatic patients across 4 inpatient facilities: a tertiary-care adult hospital, a free-standing pediatric hospital, a community-based hospital, and a behavioral health hospital. Positivity rates and the number needed to test (NNT) to identify 1 asymptomatic infected patient were calculated overall, by hospital type, by patient vaccination status, and by CDC-defined levels of community transmission. Weekly community incidence rates of COVID-19 for the system's metropolitan service area (8 central Tennessee counties) were obtained from Tennessee Department of Health records. Weekly COVID-19 incidence rates per 100,000 people were calculated using US Census Bureau data. Using a national survey of hospital epidemiologists, a clinically meaningful NNT was identified (ie, 1 positive patient per 100 patients tested). A crude admission testing cost (covering testing supplies, reagents, and lab personnel costs) was obtained from operational data ($50 per test) to assess testing utility. **Results:** In total, 51,187 tests were collected during the study period with a positivity rate of 1.8%. No periods of low transmission were observed (Table 1). During high transmission periods, the NNT met the clinically relevant threshold in all populations. In addition, the NNT approached or met the 1:100 threshold for most locations during periods of less transmission, suggesting continued benefit even as infection rates decline. In all transmission periods, the NNT for non–fully vaccinated patients met the clinically meaningful threshold, in contrast to testing of fully vaccinated patients (Table 2). **Discussion:** Implementing an asymptomatic patient admission testing program can provide clinically relevant

Table 1. Admission Testing for SARS-Cov-2 Infection in Hospitalized Patients at a Large Health System, Overall and by Specific Patient Populations Tested

		All Transmission Periods (n=60 weeks)	Moderate Transmission Periods (n=7 weeks)	Substantial Transmission Periods (n=13 weeks)	High Transmission Periods (n= 40 weeks)
All Hospitals Combined	Total # Tests Collected	51,187	5,173	10,978	35,036
	# Positive (%)	946 (1.8%)	52 (1.0%)	99 (0.9%)	795 (2.3%)
	NNT	54	99	111	44
	Total Test Costs	$2,559,350	$258,650	$548,900	$1,751,800
	Cost to Detect 1 Positive Patient	$2,700	$4,950	$5,550	$2,200
Tertiary Care Adult Hospital	Total # Tests Collected	35,962	3,740	7,888	24,334
	# Positives (%)	684 (1.9%)	36 (1.0%)	79 (1.0%)	569 (2.3%)
	NNT	53	104	100	43
	Total Test Costs	$1,798,100	$187,000	$394,400	$1,216,700
	Cost to Detect 1 Positive Patient	$2,650	$5,200	$5,000	$2,150
Pediatric Hospital	Total # Tests Collected	7,892	692	1,654	5,546
	# Positives (%)	113 (1.4%)	9 (1.3%)	10 (0.6%)	94 (1.7%)
	NNT	70	77	165	59
	Total Test Costs	$394,600	$34,600	$82,700	$277,300
	Cost to Detect 1 Positive Patient	$3,500	$3,850	$8,250	$2,950
Behavioral Health Hospital	Total # Tests Collected	2,505	239	466	1,800
	# Positives (%)	23 (0.9%)	2 (0.8%)	0	21 (1.2%)
	NNT	109	120	n/a	86
	Total Test Costs	$125,250	$11,950	$23,300	$90,000
	Cost to Detect 1 Positive Patient	$5,450	$6,000	n/a	$4,300
Community Hospital	Total # Tests Collected	4,828	502	970	3,356
	# Positives (%)	126 (2.6%)	5 (1.0%)	10 (1.0%)	111 (3.3%)
	NNT	38	100	97	30
	Total Test Costs	$241,400	$25,100	$48,500	$167,800
	Cost to Detect 1 Positive Patient	$1,900	$5,000	$4,850	$1,500

NNT: number needed to test to identify 1 positive patient