Session: P-19. COVID-19 Infection Prevention

Background. At the onset of the COVID-19 pandemic, hospitals implemented infection control measures with limited data on predictors of nosocomial SARS-CoV-2 transmission. We aimed to quantify SARS-CoV-2 presence in an inpatient setting to understand nosocomial risk.

Table 1

Variable	N	Air Sample No Virus Detected [all locations] (N=36)	Air Sample SARS-CoV-2 detected [any location] (N=13)	p-value
Length of hospital stay in days		2 [3.5]	1 [2]	0.11
Time from symptom onset in days		8 [6]	6 [4]	0.24
Nasal swab				
Positive	27	17 (63)	10 (37)	0.1
Negative	22	19 (86)	3 (14)	
HEPA				
No HEPA	32	21 (66)	11 (34)	0.29
Yes HEPA	14	12 (86)	2 (14)	
Supplemental Oxygen				
Room Air	20	12 (60)	8 (40)	0.17
Nasal Cannula	17	13 (76)	4 (24)	
High Flow Nasal Cannula	11	10 (91)	1 (9)	
Non-rebreather Mask	1	1 (100)	0 (0)	-

Data presented as N (%) or median [IQR]

Table 2:

	OR	95% CI	P	aOR	95% CI	P
Length of Stay	0.715	0.463 – 1.106	0.132	0.840	0.510 – 1.385	0.495
Nasal Swab Positive	3.519	0.832 – 14.885	0.087	2.246	0.443 – 11.397	0.329
HEPA	0.280	0.053 – 1.472	0.133	0.335	0.057 – 1.962	0.225
Room Air	3.333	0.897 – 12.383	0.072	2.095	0.485 – 9.058	0.322

Methods. Patients admitted with confirmed SARS-CoV-2 infection at an urban academic hospital were enrolled. Demographic/clinical characteristics, a PCR nasal swab(NS), and air samples on filter media in the near- (< 6ft) and far-field (>6ft) of each patient for 3.5 hours were collected. PCR was used to detect SARS-CoV-2 on filter media. Associations between clinical characteristics and presence of SARS-CoV-2 in air samples used Fisher's exact and Wilcoxon rank sum tests.

Results. Of 52 subjects, 46% had no detectable virus by nasal swab on the day of sampling. Of 104 room air samples, 16% had detectable virus from 25% of rooms, including 10 near and 7 far field samples. Subjects with a positive room air sample had fewer days from symptom-onset compared with those with a negative air sample (median 6 vs. 8, p=0.24). Being on room air and having a nasal swab positive increased the odds of detecting virus in air samples but were not statistically significant.

Conclusion. A small number of air samples with detectable SARS-CoV-2 may suggest lower nosocomial risk than previously anticipated. Multiple subject and environmental factors may have contributed to this finding including patient source control masking, anti-viral therapies and HEPA filtration. The decreased association of virus in the air of those with more days of symptoms but with the need for supplemental oxygen may be related to what is now known about the COVID-19 inflammatory response after the infectious period.

Disclosures. **All Authors**: No reported disclosures

418. Low Frequency of Healthcare Worker Infections Following Occupational Exposures to COVID-19

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CDC Epicenters

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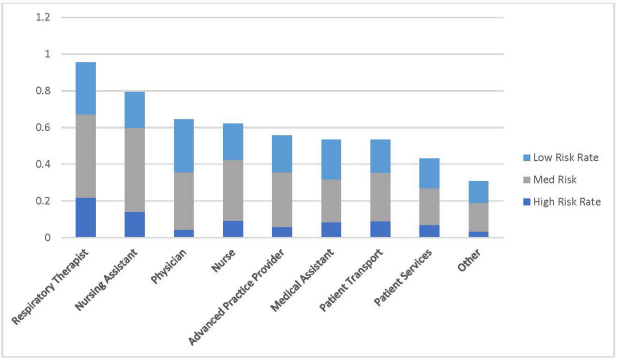
Background. Data on occupational acquisition of COVID-19 in healthcare settings are limited. Contact tracing efforts are high resource investments.

Table 1: Exposure risk classifications (adapted from CDC Interim U.S. Guidance for Risk Assessment and Work Restrictions for Healthcare Personnel with Potential Exposure to SARS-CoV-2).

Type of Exposure	High Risk	Medium Risk	Low Risk
Household Exposure	Always high risk	--	--
Contact with unmasked COVID-19 positive patient, HCW, or visitor for > 15 min and < 6 ft while at work	Exposed healthcare worker NOT wearing a surgical facemask or respirator	Exposed healthcare worker wearing surgical facemask or respirator but no eye protection	Exposed healthcare worker wearing a surgical facemask and eye protection but no gown or gloves Healthcare worker wearing all recommended PPE
Contact with masked COVID-19 patient or HCW for > 15 min and < 6 ft at work	--	Exposed healthcare worker NOT wearing a surgical facemask or respirator, or no PPE at all	Exposed healthcare worker wearing surgical facemask or respirator but no eye protection Exposed healthcare worker wearing a surgical facemask and eye protection but no gown or gloves Exposed healthcare worker wearing all recommended PPE
Performed a high-risk aerosol-generating procedure on COVID-19 patient	Healthcare worker wearing gown, gloves, and surgical facemask but no eye protection	Healthcare worker wearing a gown, gloves, eye protection, surgical facemask	Healthcare worker wearing a gown, gloves, eye protection, N95 or PAPR

Figure 1. Number of reported exposures per number of healthcare workers in each job category, stratified by adjudicated exposure risk.



Methods. Duke Health developed robust COVID-19 contact tracing methods as part of a comprehensive prevention program. We prospectively collected data on HCW exposures and monitored for development of symptomatic (SYX) and asymptomatic (ASYX) COVID-19 infection after documented high-, medium, and low-risk exposures. HCWs were required to self-report exposures or were identified through contact tracing as potentially exposed to COVID-19 positive HCWs, patients or visitors. Contact tracers interviewed exposed HCWs and assessed the risk of exposure as high-, medium-, or low-risk based on CDC guidance (Table 1). Testing was recommended at 6 days after high- or medium-risk exposures and was provided upon HCW request following low-risk exposures. Our vaccination campaign began in 12/2020.

Table 2: Rate of HCW COVID-19 infections following different types of occupational exposures.

Exposure Risk Category	Exposures	Conversions	Asymptomatic Conversions	Conversion Rate
Exposure to HCW	3198	179	20	5.6%
High	548	97	9	17.7%
Medium	1383	76	10	5.5%
Low	1267	6	1	0.5%
Exposure to patient	3408	81	8	2.4%
High	315	11	1	3.5%
Medium	2014	67	7	3.3%
Low	1079	3	0	0.3%

Results. 12,916 HCWs registered in the contact tracing database. From March 2020-May 2021, we identified 6,606 occupational exposures (0.51 exposures/HCW). The highest incidence of workplace exposures per number of HCWs in each job category was among respiratory therapists (RT) (0.95 exposures/RT), nursing assistants (NA) (0.79 exposures/NA), and physicians (0.64 exposures/physician). The most common exposure risk level was medium (51.4%), followed by low (35.5%), and then high (13.1%). A total of 260 (2%) HCW had positive tests/conversions; 28 (10.8%) were ASYX at the time of testing. High-risk exposures had a significantly greater number of post-exposure infections compared to medium- and low-risk exposures

(12.5% vs. 4.2%, vs. 0.4%; p < 0.001). The rate of SYX infection following exposure to a fellow HCW (179/3,198; 5.6%) was higher than that following exposure to a patient (81/3,408; 2.4%; p< 0.001).

Conclusion. Conversion following exposure to COVID-19 in the healthcare setting with appropriate protective equipment was low. Incomplete testing of all exposed individuals was a limitation and our data may under-estimate the true conversion rate. Our findings support our local practice of not quarantining HCWs following non-household exposures. Limiting contact tracing to only high or medium risk exposures may best utilize limited personnel resources.

Disclosures. **Rebekah W. Moehring, MD, MPH**, **UpToDate, Inc.** (Other Financial or Material Support, Author Royalties)

419. SARS-CoV-2 Environmental Surface Contamination of Healthcare Staff Common Areas

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The CDC Prevention Epicenters Program

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Background. There are limited data regarding SARS-CoV-2 (SC2) environmental contamination in staff areas of healthcare settings. We performed environmental sampling of staff areas in wards where coronavirus disease 19 (COVID-19) patients received care and compared findings to surfaces within COVID-19 patient rooms.

Methods. The study was conducted at the Hospital of the University of Pennsylvania (Philadelphia, PA) from 9/15/20-1/26/21. Sampling of 20cm^2 surfaces in staff common areas (breakroom high-touch surfaces comprising tables and microwave/refrigerator handles; bathroom surfaces comprising toilet, sink, and doorknob; and floors), nurse workstations (computer mice and floors), and COVID-19 patient rooms (high-touch surfaces comprising bedrail, computer mice/keyboards, and doorknobs; bathroom surfaces; and floors) was performed using flocked swabs one or more times per week. Specimens underwent RNA extraction and quantitative real-time polymerase chain reaction to detect the SC2 N1 region. Median comparisons were performed using Wilcoxon rank sum test. Trends in odds were evaluated using Score test.

Results. Proportions of surface specimens with detectable SC2 RNA are summarized in Table 1. Median copy numbers were lower among staff toilets compared to COVID-19 patient toilets (135.6 vs. 503.8 copies/specimen, p=0.02), lower among staff breakroom compared to patient room high-touch surfaces (104.3 vs. 220.3 copies/specimen, p=0.007), and similar between staff and patient room samples from sinks and floors. At nurse workstations, SC2 RNA was detected among 22/177 (12.4%) computer mouse and 147/178 (82.6%) floor samples. Odds of SC2 detection increased by study week among common area (p< 0.001) and nurse workstation samples (p< 0.001) (Figures 1 and 2).

Table 1. SARS-CoV-2 (SC2) RNA detection on staff common area and coronavirus disease 19 (COVID-19) patient room surfaces at the Hospital of the University of Pennsylvania, 9/15/20-1/26/21.

Surface type	Staff common area *no. of specimens with detectable SC2 RNA/total no. (%)*	COVID-19 patient room *no. of specimens with detectable SC2 RNA/total no. (%)*
High-touch surface	26/240 (10.8%)	246/760 (32.4%)
Bathroom	14/240 (5.8%)	106/567 (18.7%)
Floor	120/160 (75.0%)	444/574 (77.4%)

Figure 1. Proportion of environmental surface specimens with detectable SARS-CoV-2 RNA from a) staff common areas and b) nurse workstations of inpatient wards where coronavirus disease-19 patients received care at the Hospital of the University of Pennsylvania, 9/15/20-1/26/21.

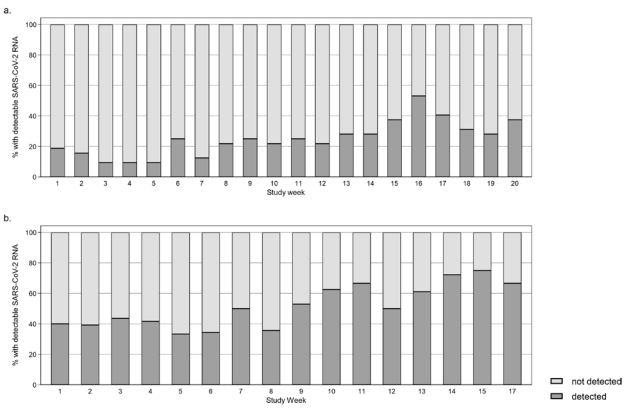
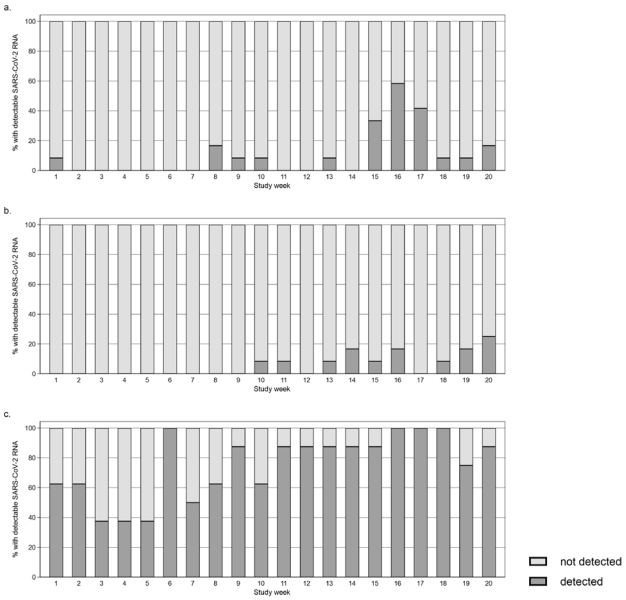


Figure 2. Proportion of environmental surface specimens with detectable SARS-CoV-2 RNA in staff common areas of inpatient wards where coronavirus disease-19 patients received care at the Hospital of the University of Pennsylvania, 9/15/20-1/26/21, by surface type: a) staff breakroom surfaces, b) staff bathroom surfaces, c) staff common area floors.



Conclusion. A low prevalence of detectable SC2 RNA was observed among staff area high-touch surfaces; however, the likelihood of detection increased over time. Environmental SC2 RNA detection may reflect primary contamination from infected healthcare workers or secondary contamination from contact with infected patients, though a direct relationship between surface SC2 RNA viral detection and transmission risk has not been established.

Disclosures. **Michael Z. David, MD PhD**, **GSK** (Board Member) **Ebbing Lautenbach, MD, MPH, MSCE**, **Merck** (Other Financial or Material Support, Member of Data and Safety Monitoring Board (DSMB))

420. Emergency Nurses' Experiences over 1 Year of the COVID-19 Pandemic: A Qualitative Study

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