Presentation Type:
Poster Presentation - Poster Presentation
Subject Category: Respiratory Viruses
Differential viral load of surgical masks worn by patients infected with respiratory viruses
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Background: This study investigated viral load in surgical masks worn by adult patients infected with respiratory viruses. **Method:** Surgical masks were dissected into eight pieces at pre-selected sites: inner, middle, and outer layers at the nose (N1-N3) and mouth (M1-M3), as well as full-thickness on the right (RS) and left (LS) sides. Viral load was detected, correlated with nasopharyngeal specimens and patients' demographics. **Result:** Among 230 patients infected with influenza A virus (n=91), respiratory syncytial virus (RSV) (n=61), and SARS-CoV-2 (n=78) from April 1 to August 31, 2023, 90.9% (209/230) were from the medical specialty. Of the 230 surgical masks collected, viral RNA was detected in 79.6% at one or more sites, with 75.7% positive at N1 or M1, 55.2% positive at N3 or M3, and 22.6% exhibiting viral RNA at all sites. Pearson correlation showed viral load correlation between nasopharyngeal specimens and N1 (0.244, p=0.002) and M1 (0.174, p=0.031). The mean viral load at N1 (4.14 ± 1.46 log10 copies/ml) was significantly higher than M1 (3.74 ± 1.32 log10 copies/ml, p=0.014) and N3 (3.58 ± 1.27 log10 copies/ml, p=0.003). Significant differences in viral load were observed across N1-N3 and M1-M3 in RSV patients, but not in influenza A or SARS-CoV-2 patients. SARS-CoV-2 patients exhibited significantly lower viral load at RS and LS sites compared to influenza A or RSV patients. **Conclusion:** Viral RNA was detected in N3 or M3 sites in our masks, highlighting the potential risk associated in these areas. Differential viral load across various sites in surgical masks worn by patients infected with different respiratory viruses warrants further investigation.

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Subject Category: Respiratory Viruses Other than SARS-CoV-2
Impact of Universal Masking by Healthcare Personnel on Non-SARS-CoV-2 Healthcare-Associated Viral Respiratory Infections
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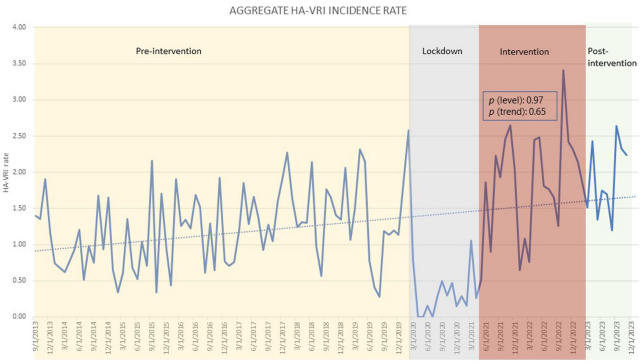
Background: The impact of universal masking on transmission of endemic respiratory viruses in children's hospitals is unknown. Our objective was to measure the association between universal masking by healthcare personnel and the incidence of non-SARS-CoV-2 healthcare-associated viral respiratory infections (HA-VRIs) in a free-standing academic pediatric medical center during the COVID-19 pandemic. **Methods:** In this quasi-experimental study, we measured the incidence rate of non-SARS-CoV-2 HA-VRIs (VRI diagnosed on or after hospital day 3 by one of several molecular assays) during three time periods: prior to the COVID-19 pandemic (pre-intervention: September 2013 - February 2020); during universal masking (intervention: May 2021 - March 2023); and after universal masking was lifted (post-intervention: April 2023 - November 2023). Although universal masking was implemented in late March 2020, we exclude the lockdown period of strict COVID-19-related public health mitigations (i.e., school closures and shelter-in-place advisories) during which community prevalence of non-SARS-CoV-2 respiratory viruses was minimal in our region (March 2020 to April 2021). By negative binomial regression analysis, we compared the level and trend of HA-VRIs between the pre-intervention and intervention periods. **Results:** Figure 1 illustrates



the incidence rate of non-SARS-CoV-2 HA-VRI during the pre-intervention, lockdown, intervention, and post-intervention periods. The aggregate non-SARS-CoV-2 HA-VRI incidence rate during the pre-intervention, intervention, and post-intervention periods was 1.25, 1.84, and 1.96 HA-VRIs per 1000 patient days, respectively. There was no significant difference in the level (p = 0.96) or trend (p = 0.67) of HA-VRI incidence rate between the pre-intervention and intervention periods. **Conclusion:** Universal masking was not associated with a decrease in the incidence rate of non-SARS-CoV-2 HA-VRIs at our children's hospital during the COVID-19 pandemic. These findings suggest that universal masking may not be an effective infection prevention measure in children's hospitals during periods of increased endemic respiratory viral transmission in the community.
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Subject Category: SSI
Effect measure modification in an RCT of antibiotic prophylaxis in laparoscopic cholecystectomy: A secondary analysis
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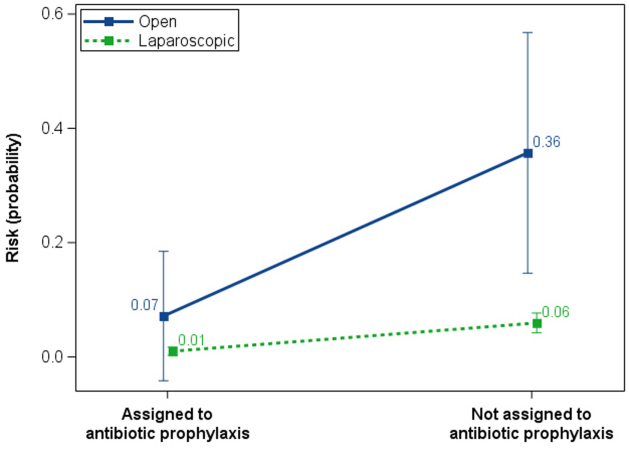
Background: Antimicrobial resistance is a growing public health threat. To alleviate selective pressure which leads to the emergence and proliferation of resistance, and to preserve the utility of treatments where they are needed the most, antimicrobial stewardship programs (ASPs) could consider revising surgical antibacterial prophylaxis protocols for low-risk procedures such as laparoscopic cholecystectomy. **Methods:** Publicly available data was used from a well-powered randomized controlled trial conducted by Matsui and colleagues during 2007-2013 in Japan on the effectiveness of prophylactic antibacterial treatment on reducing post-operative infections following laparoscopic cholecystectomy in low-risk patients. A total of 1037 patients were randomized to receive treatment or no treatment. After randomization, laparoscopic cholecystectomies were converted to open procedures in 28 patients, 14 in each arm, constituting a deviation from the protocol and the administration of additional antibacterial treatment. The original study included both intention-to-treat and per-protocol analyses, finding statistically significant reductions in post-operative infections in the treatment vs no treatment arm (1.2% vs 6.7%, p<0.0001; 1.0% vs 5.9%, p<0.0001, respectively). In the present analysis I assessed the extent to which type of procedure modified the effect of antibacterial prophylaxis on post-operative infection using both additive and multiplicative interaction. Risk and risk differences were estimated using a linear-binomial model and risk ratios were estimated using a log-binomial model. Alpha was set to 0.10. The lowest risk categories for each variable, being assigned to treatment and receiving a laparoscopic procedure, defined the common reference category. **Results:** A 35 percentage point (pp) increase in the risk of post-op infections relative to the reference category



SSI Depth	Location Where SSI was Diagnosed			
	Current Admission (N=2618)	Outpatient (N=1581)	Readmissio n (N=7418)	Total (N=11617)
Deep (% row)	293 (11.2)	151 (5.7)	2182 (83.1)	2626
Organ (% row)	1521 (30.4)	164 (3.3)	3310 (66.3)	4995
SSISSI (% row)	112 (5.5)	0 (0)	1926 (94.5)	2038
Superficial (% row)	692 35.3)	1266 (64.7)	0 (0)	1958
Total	2618 (22.5)	1581 (13.6)	7418 (63.9)	11617

Surgical Procedure Category	SSI Depth				
	Organ N=4995 (% column)	Deep N= 2626 (% column)	SSISSI N= 2038 (% column)	Non-SSISSI Superficial N=1958 (% column)	Total N= 11617
GI	2815 (65.4)	588 (22.4)	653 (32.0)	1013 (51.7)	5069
Orthopedics	847 (17.0)	1051 (40.0)	489 (24.0)	205 (10.5)	2592
Gynecology	710 (14.2)	145 (5.5)	367 (18.0)	480 (24.5)	1702
Neurology	265 (5.3)	458 (17.4)	245 (12.0)	80 (4.1)	1048
Other	272 (5.4)	275 (10.5)	173 (8.5)	126 (6.4)	846
Cardiology	86 (1.7)	109 (4.1)	111 (5.4)	54 (2.8)	360

Hosp ID	SSI total Rate	Complex SSI Rate	Complex+SSISSI Rate	Complex SSI Rank	Complex+SSISSI Rank	Change in Rank from Complex to Complex+SSISSI Rank
44	6.20	4.55	5.37	1	1	0
43	3.78	2.44	2.99	2	2	0
28	2.80	1.81	2.06	4	4	0
46	2.79	1.90	2.17	3	3	0
21	1.87	1.10	1.40	6	5	1
45	1.73	1.15	1.39	5	6	-1
37	1.72	0.90	1.27	8	8	0
32	1.62	0.83	1.11	11	11	0
34	1.52	0.77	0.99	13	13	0
19	1.47	0.86	1.15	9	10	-1
40	1.47	0.65	0.86	19	18	1
22	1.46	1.07	1.28	7	7	0
3	1.42	0.84	1.18	10	9	1
33	1.38	0.57	0.93	25	15	10
47	1.13	0.59	0.74	22	23	-1
26	1.08	0.73	0.92	14	16	-2
10	1.06	0.82	1.01	12	12	0
27	1.06	0.71	0.92	15	17	-2
7	1.05	0.42	0.76	35	22	13
30	1.03	0.60	0.71	21	27	-6
12	1.02	0.65	0.96	20	14	6
36	0.93	0.67	0.74	17	24	-7
23	0.92	0.69	0.85	16	19	-3
41	0.92	0.59	0.76	23	21	2
1	0.84	0.55	0.73	26	25	1
13	0.82	0.43	0.59	33	32	1
24	0.80	0.58	0.72	24	26	-2
9	0.79	0.65	0.77	18	20	-2
5	0.77	0.53	0.69	27	28	-1
17	0.76	0.45	0.59	32	33	-1
38	0.75	0.47	0.63	31	29	2
29	0.73	0.49	0.60	28	30	-2
2	0.72	0.42	0.56	34	36	-2
11	0.71	0.40	0.58	37	34	3
25	0.69	0.37	0.46	38	38	0
14	0.69	0.41	0.53	36	37	-1
16	0.66	0.49	0.60	29	31	-2
39	0.61	0.47	0.57	30	35	-5
6	0.53	0.31	0.46	39	39	0
4	0.51	0.26	0.37	42	42	0
31	0.48	0.31	0.41	41	41	0
18	0.44	0.31	0.43	40	40	0
8	0.42	0.26	0.37	43	43	0
42	0.30	0.22	0.26	44	44	0
20	0.21	0.07	0.14	46	45	1
35	0.14	0.09	0.12	45	46	-1
15	0.05	0.02	0.02	47	47	0

was attributable to the joint effects of omitting prophylaxis and conversion to an open procedure (90% CI 14, 56), compared to a 5 pp increase attributable to omission of prophylaxis (90% CI 3, 7) or a 6 pp increase attributable to conversion to an open procedure (90% CI -5, 18) by themselves. The interaction contrast capturedthis super-additive 24 pp increase in risk (90% CI -1, 47). The relative excess risk due to interaction was 23.81 (90% CI -5.56, 53.19), suggesting a departure from additivity as well. **Conclusions:** Patients undergoing open cholecystectomies stand to benefit the most from antibacterial prophylaxis compared to patients who have laparoscopic cholecystectomies. ASPs could consider reducing or eliminating surgical prophylaxis in low-risk procedures such as laparoscopic cholecystectomy to alleviate selection pressure for antibacterial resistant organisms and preserve its effectiveness for people undergoing higher risk procedures.

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A Deeper Look at Proposed Surveillance of Superficial Incision Surgical Site Infections (SSISSIs)

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Although the National Healthcare Safety Network (NHSN) recommends the reporting of superficial incisional SSIs, the standardized infection ratio (SIR) models used by the NSHN exclude superficial incisional SSIs cases. Yet, some superficial incisional SSIs may lead to serious adverse patient outcomes. We previously proposed a new category of such infections: serious superficial incisional surgical site infections (SSISSIs), defined as a superficial incisional SSI that (1) required debridement in an operating room and/or (2) led to a hospital readmission within 30 days of surgery. The objective of our study was to determine the prevalence of SSISSIs in a large network of community hospitals and compare hospital rankings of SSI rates of organ/space and deep SSIs (complex SSIs) with and without SSISSIs. We performed a retrospective descriptive analysis of prospectively collected data on 35 NHSN surgical categories in 47 community hospitals within the Duke Infection Control Outreach Network (DICON) from 1/1/2013-12/31/2022. All hospitals used standardized surveillance and data collection strategies throughout the study period. The Wilcoxon rank-sum was used to test for differences in performance rankings of hospitals sorted by rates of complex SSIs alone compared to complex and SSISSI rates. A two-tailed P value of .05 or less was considered significant. Overall, 11,617 SSIs occurred after 1,272,257 surgeries (0.91 SSIs/100 procedures). Out of 3,996 superficial SSIs, 2,038 (17.5% overall, 51.0% of superficial incisional) met criteria for SSISSI. 112 (5.5%) were diagnosed during the current admission and required takeback to the OR for infection; 1,926 (94.5%) were diagnosed during a readmission; and 3841 (33.1%) were diagnosed during readmission and returned to the OR. (Table1) The highest proportion of SSISSIs was diagnosed in patients who underwent gastrointestinal surgery (32.0%) or orthopedic surgery (24.0%). (Table2) Performance ranking of individual hospitals based on rates of complex SSIs, differed significantly when including SSISSIs (p= 0.02). (Table3) Discussion Our findings suggest that SSISSIs make up a moderate but important proportion of SSIs in community hospitals. SSISSIs can be identified through established database surveillance looking at objective measures of returning to the OR for debridement and/or re-admission within 30 days. Hospital rankings differed significantly when SSISSIs were added to complex SSIs to calculate SSI rates. As such, including SSISSIs likely provides a more accurate depiction of SSIs with important outcomes and is not as subjective to surveillance bias. Next steps would be specifically to look at outcomes data for complex SSIs compared to SSISSIs to fully evaluate the

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