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SHEA

Concise Communication

The impact of coronavirus disease 2019 (COVID-19) response on hospital infection prevention programs and practices in the southeastern United States

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Abstract

Initial assessments of coronavirus disease 2019 (COVID-19) preparedness revealed resource shortages and variations in infection prevention policies across US hospitals. Our follow-up survey revealed improvement in resource availability, increase in testing capacity, and uniformity in infection prevention policies. Most importantly, the survey highlighted an increase in staffing shortages and use of travel nursing.

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Early assessments of coronavirus disease 2019 (COVID-19) preparedness revealed resource shortages, use of crisis capacity strategies, and gradual adoption of universal masking policies in US hospitals.[1–3] Our initial survey in spring 2020 highlighted several differences in COVID-19 preparedness with respect to the use of crisis capacity strategies and protocols related to testing, masking, and restarting elective procedures in community hospitals within our network.[1] We performed a 1-year follow-up survey to assess changes to infection prevention policies and resources in our diverse network of community and academic hospitals.

Methods

Design

We performed a cross-sectional electronic survey of infection preventionists in 58 hospitals. This study was approved by the Duke University Health System institutional review board (no. Pro00107094).

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Setting

In addition to 56 community hospitals in the Duke Infection Control Outreach Network (DICON), the hospitals surveyed included 2 large academic medical centers: Duke University Hospital, a 957-bed, acute-care, academic, tertiary-care facility in Durham, North Carolina, and the University of North Carolina Medical Center, a 905-bed, academic medical center in Chapel Hill, North Carolina. DICON provides infection control services to community hospitals and surgery centers ranging in size from 50 to 685 beds (median, 162 beds) in 6 states: North Carolina, South Carolina, Virginia, Florida, Georgia, and West Virginia.[4]

Survey instrument and distribution

The survey (Supplementary Material online) was conducted between April 22 and May 5, 2021, in follow-up to our initial survey from April 2020.[1] Both surveys were distributed electronically to local infection preventionists using Qualtrics software (Qualtrics, Provo, UT). Participation was voluntary, anonymous, and without compensation. The follow-up survey included 26 questions related to personal protective equipment (PPE) availability, policies related to restarting surgeries, testing, universal masking, eye protection, daily screening of hospital staff, and staffing challenges. High-risk setting for eye protection was defined as participating in an aerosol-generating procedure or exposure to a confirmed or suspected case of COVID-19.[5] Enhanced PPE for procedural areas was defined as N95 or equivalent, or higher-level respirator, eye protection, gloves, gown, shoe covers, and patient masks.[6]

Table 1. Changes in Infection Prevention Policies and Practicies in a Network of 58 Hospitals During the SARS-COV-2 Pandemic

Variable	Initial Survey (April 2020), No. (%[a])	Follow-Up Survey (April 2021), No. (%[a])	*P* Value
Total hospitals surveyed	50 (83)	55 (95)	
Personal protective equipment (PPE) and screening			
Reprocessing of N95 respirators	36 (72)	19 (32.7)	<.01
Universal masking of employees, staff, and visitors	38 (76)	50 (100)	<.01
Universal eye protection	NA	7 (13.2)	NA
Eye protection	NA	7 (13.2)	
In high-risk settings		39 (73.5)	
In patient rooms, emergency department, when patient is unmasked			NA
Universal employee screening	45 (90)	52 (100)	.02
Surgeries/Procedures			
Suspended elective procedures	43 (86)	36 (94.7)	.18
Enhanced PPE for surgical procedures if preoperative testing was not performed	NA	8 (15%)[b]	NA
Enhanced PPE for surgical procedures for suspected or confirmed COVID-19 cases	NA	8 (15)	NA
Change from test based to time-based strategy for removal of isolation	NA	50 (92.4)	NA
Testing			
In-house testing for SARS-COV-2	34 (68)	47 (81)	.11
Weekly testing capacity >100 tests	NA	22 (40)	NA
Universal pre-admission testing	NA	32 (59.2)	NA
Preoperative testing			
For all or most surgeries	43 (86)	43 (78.2)	.29
For some surgeries		10 (18.2)	
Testing asymptomatic patients prior to discharge to long-term-care facility	17 (34)	37 (67.3)	<.01
Staffing			
Infection prevention furloughs, staffing cuts, and or reassignments	NA	14 (25.5)	NA
Use of travel or short-term agency nurses	NA	45 (81.8)	NA

Note. NA, not applicable
[a]Reflects accurate percentage based on denominator for each question.
[b]This number only reflects use of enhanced PPE when preoperative testing was not done, remaining facilities always performed preoperative testing.

Analysis

Survey responses were analyzed using descriptive statistics. Differences in proportions between the first survey and the current survey were compared using the Z test. $P < .05$ was considered statistically significant. Data analyses were performed using Stata version 14.0 software (StataCorp, College Station, TX).

Results

In total, 55 hospitals responded to our follow-up survey (response rate, 95%). Changes to policies and practicies related to PPE, screening, elective surgeries, testing, and staffing in our initial and follow-up surveys are summarized in Table 1. Denominators for each question were different revealing different percentages.

Personal protective equipment (PPE)

Hospitals reported significant improvement in PPE and resource shortages on the follow-up survey compared to our initial survey (Fig. 1). Even though supply shortages improved over time, >30% of hospitals reported the use of different brands of products to maintain supply levels of PPE, hand sanitizer, and environmental disinfectants. In the follow-up survey, 19 hospitals (32.7%) were still reprocessing N95 respirators, primarily with a form of vaporized hydrogen peroxide. All hospitals were universally masking at the time of follow-up survey, with 50% of these protocols initiated in April 2020. Most other hospitals started universal masking in March or May 2020.

Surgeries and procedures

On the follow-up survey, 36 (94.7%) of 38 hospitals reported suspending elective procedures. Among them, 75% were suspended in March–April 2020 and restarted in May–June 2020. Moreover, 43 hospitals (78.2%) performed routine preoperative testing for severe acute respiratory coronavirus virus 2 (SARS-CoV-2) for most surgeries, and 10 performed preoperative testing for some surgeries. Among the 16 hospitals where routine preoperative testing was not done for all surgeries, 8 of these hospitals reported using enhanced PPE during surgical procedures only for confirmed or suspected

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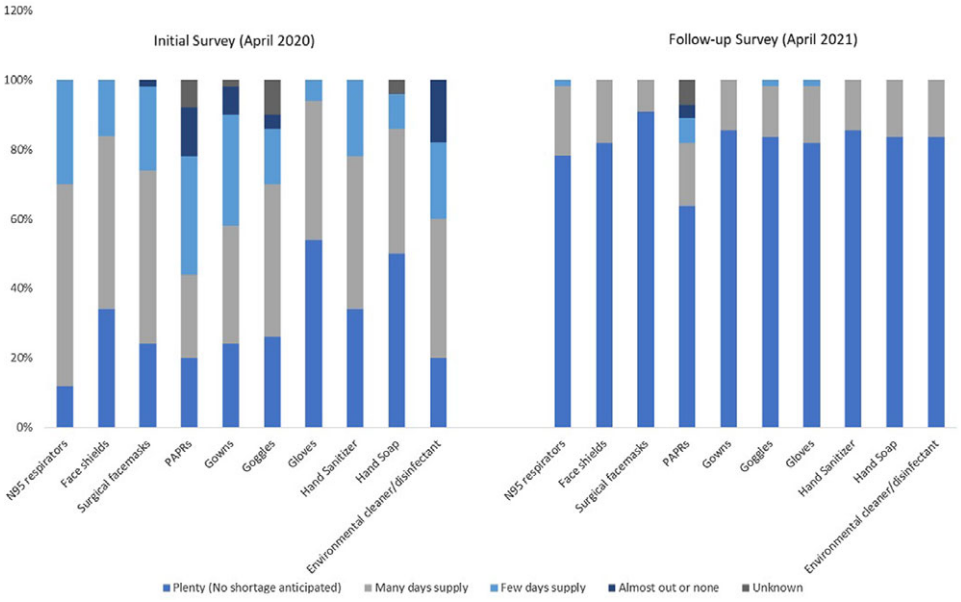

Fig. 1. Comparison of resource availability in the initial and follow-up survey of network of hospitals in the southeastern United States.

cases of COVID-19, and the remaining 8 hospitals used enhanced PPE for all cases.

Testing and screening

On the follow-up survey, 47 hospitals (81%) reported using in-house testing for SARS-COV-2, with a weekly capacity of >100 tests in 22 hospitals. Moreover, 28 hospitals (87.5%) used polymerase chain reaction (PCR) tests for preadmission testing, and 4 hospitals used antigen tests. Also, 50 hospitals (92%) switched from test-based to time-based strategy for discontinuing isolation precautions by August–September 2020. Furthermore, 3 hospitals continued to use a test-based strategy at the time of the follow-up survey. According to our survey results, 34% of responding hospitals started a symptom screening protocol for healthcare personnel (HCP) in March 2020, and 52% of hospitals implemented the screening process in April 2020.

Staffing

Overall, 14 hospitals (25%) reported increase in staff turnover, furloughs, and reassignments of infection prevention staff during the pandemic, and 45 (81.8%) hospitals reported an increase in use of travel or temporary nursing.

Discussion

Our follow-up survey of COVID-19 preparedness has revealed improvement in PPE and resource availability. This improvement could be attributable in part to various conservation strategies used to preserve PPE, use of different brands of PPE, suspension of elective procedures during the surge of cases, and/or improvement in supply chain of PPE over time.[1,7] Our survey is the first to our knowledge to assess the trend of infection prevention practices in a large network of academic and community hospitals in the United States during the COVID-19 pandemic.

The follow-up survey also demonstrated increasing uniformity in infection prevention practice and policies with adoption of universal masking and daily HCP screening protocols across most hospitals. Although universal eye protection was not widely adopted, most surveyed hospitals used eye protection in high-risk settings and in patient rooms.[8] The improvement in PPE and testing capacity eventually led to restarting elective surgeries by June 2020 in most hospitals. The follow-up survey also highlighted burdensome staffing changes with reassignments of infection prevention staff to other operational areas (eg, occupational health-vaccine clinics, etc). In addition, increase in use of travel or temporary nursing likely led to a lapse in infection prevention practices, which could have contributed to an increase in device-associated infections during the pandemic.[9]

Our study had several limitations. This cross-sectional study relied on self-reported data from infection preventionists, and it excluded nursing homes. We included additional questions in our follow-up survey compared to our initial survey to include newer guidance related to eye protection and to highlight infection prevention staffing challenges. Although we only surveyed hospitals in the southeastern United States, we were able to improve the generalizability of our follow-up survey by including academic medical centers in addition to community hospitals.

In conclusion, our comparison of surveys suggests increasing uniformity in infection prevention policies across our network of community and academic hospitals in the southeastern United States. At the same time, the follow-up survey highlights the challenges created by staffing furloughs, increased use of travel nurses, and reassignment of critical personnel like infection preventionists to other duties during the pandemic. Our next steps include looking at the impact of these infection prevention policy changes and staffing challenges on the rates of healthcare-associated infections in our network of academic and community hospitals during the COVID-19 pandemic.

Supplementary material. To view supplementary material for this article, please visit https://doi.org/10.1017/ice.2021.460

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