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INNOVATION REPORT

Universal Protection: Operationalizing Infection Prevention Guidance in the COVID-19 Era

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Introduction: The COVID-19 pandemic has required facilities to quickly respond to a myriad of infection prevention recommendations, as well as design their own protocols. The varied and changing guidance has been difficult for staff to absorb and has presented challenges for managing compliance.

Approach: HCA Healthcare recognized the need for a coordinated approach to managing infection prevention guidance during the COVID-19 pandemic and a mechanism for monitoring compliance and responding to implementation challenges remotely. This innovation consisted of a bundle of infection prevention guidance referred to as the Universal Protection Framework that collated existing recommendations into an easy-to-understand structure with four domains: core infection prevention practices, access control, distancing, and patient flow. This was supported by education and clear communication. A remote monitoring program that incorporated a combination of report review and virtual observation via videoconferencing using an on-site leader as a navigator for the discussion assessed 46 survey domains for compliance.

Results: This framework was implemented in a large health care system, and to date compliance has been monitored at 15 facilities. Overall, compliance was high (average, 90%). High compliance was seen with oversight and distribution of personal protective equipment, cohorting of COVID-19 patients, facility access controls, and employee exposure monitoring. Challenges were identified in compliance with social distancing and universal masking.

Conclusion: Complex infection prevention expectations for COVID-19 can be communicated and implemented by bundling into a simple framework. This innovation also demonstrated that compliance can be measured remotely, which may be useful even after the pandemic challenges have passed.

The COVID-19 pandemic has advanced across the globe with breathtaking speed, with regions going from a handful of cases to thousands in a matter of weeks. In the United States the number of COVID-19–related deaths surpassed 200,000 in September 2020, and the case count continues to rise.¹ At the same time, scientific understanding of the transmission and infection mechanism of SARS-CoV-2, the virus underlying the COVID-19 disease, has evolved since the beginning of the pandemic. As a result, infection prevention programs within health care facilities have required continuous adaptations to align with changes in knowledge and guidance.

The Centers for Disease Control and Prevention has maintained the principal infection control guidance during the COVID-19 pandemic.² The interim infection prevention and control recommendations for health care personnel, one of many guidance documents, spans multiple pages and has been updated numerous times since its initial release. Interpreting and implementing these changing guide-

lines while managing the response to rapid disease spread is a challenge for infection prevention in health care facilities.

For infection prevention practices to be most effective, they must be consistently used throughout the changing health care environment. Achieving this requires the development of clear standards, appropriate and understandable communication of standards to staff, and the use of a mechanism to audit compliance. In recognition of the difficulties of this in the current environment, one large health care system created a bundle of infection prevention practices that collated current COVID-19 guidance into a uniform standard framework and monitored compliance with that standard.

APPROACH

Development

During the initial surge in COVID-19 hospitalizations, HCA Healthcare convened a leadership team to coordinate efforts across the enterprise. HCA Healthcare comprises 184 hospitals and approximately 2,000 sites of care, including surgery centers, freestanding emergency departments, urgent care centers, and physician clinics in 21 states and

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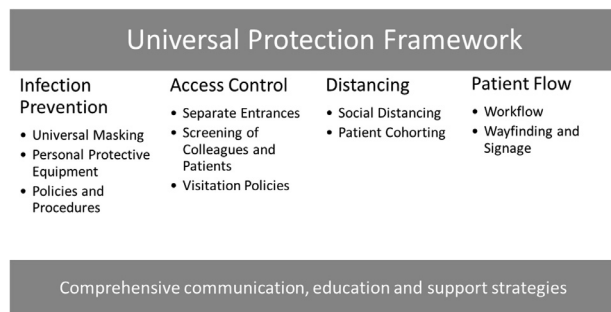


Figure 1: The Universal Protection Framework is a holistic approach that consists of four domains, supported by communication and education.

the United Kingdom. Enterprise-level functions, including the support of the COVID-19 response, were coordinated by clinical and operational leaders at the corporate headquarters in Nashville, Tennessee, in collaboration with and in response to the feedback from facility leadership and field colleagues.

The COVID-19 leadership team received continuous feedback from the field relating to COVID-19 policies and protocols. A consistent theme in this feedback was the existence of too many isolated guidance documents without a coherent overarching structure. This lack of structure, stemming from multiple domains that needed to be addressed, such as visitation, screening, social distancing, and cohorting, resulted in a lack of coherent messaging for staff and reports of inconsistent interpretation and infection prevention practices.

To address this feedback, the COVID-19 leadership team developed the concept of the Universal Protection Framework. This concept builds on traditional infection prevention practices such as universal precautions (treating all blood and body fluids as potentially infectious), as well as standard precautions, which incorporate other pathogens that can be transmitted via droplets and aerosols. Standard precautions allow for effective use of personal protective equipment (PPE), which includes respiratory protection (face masks and respirators), eye protection (face shields and goggles), gowns, and gloves, allowing for safe and protective practice for the health care worker. This bundle of infection prevention maneuvers is accompanied by operational measures that are presented in a way that supports the implementation of COVID-19–specific guidance in a streamlined manner in the changing pandemic environment.

Components

The Universal Protection Framework is a holistic approach that consists of a bundle with four domains, supported by communication and education (Figure 1). The four domains are defined as follows:

1. Core infection prevention practices. Key elements include universal masking (personnel, visitors, and

patients when tolerated), use of personal protective equipment, environmental safety, and policies and procedures relating to bedside practice in the COVID-19 population.

2. Access control. This domain incorporates guidance relating to visitation, personnel screening, and physical security.
3. Distancing, which outlines policies relating to social distancing, the setup of public spaces, and patient cohorting.
4. Patient flow. The area of focus here is the management of patients as they traverse the building so as to minimize risk of exposure.

A common strategy within these domains is the minimization of unnecessary workflow. The limitation of visitors, for instance, allowed higher efficiency in care delivery without the common disruptions of excess traffic. The reduction of entrances also allowed for better control and monitoring of personnel into the facilities, minimizing exposure. Core foundational infection prevention practices were incorporated, centered on proper hand hygiene and surface disinfection.

The development of the Universal Protection Framework incorporated some of the learnings from the national experience with bloodborne pathogens, in which a number of different infection prevention maneuvers were bundled into a single concept for implementation. An additional learning from that experience was that there is no foolproof way to identify sources of risk ahead of time, and therefore a broad-based approach to infection prevention is necessary.

The framework components were supported by a foundation of educational materials and online coaching calls with physicians, nursing staff, infection prevention staff, and administrators. Through the course of April and May 2020, a series of communications were completed to reach our workforce, beginning with leadership and cascading to frontline professionals. The key message was that safety is paramount for patients in our care and for clinicians delivering that care. The initial communication was targeted to regional leadership (for example, chief medical officers and nurse executives), and the same narrative was delivered to division infection prevention leaders. In addition, target key clinical stakeholders, including facility chief medical officers and chiefs of staff and surgeons, were provided education. Because there was a strong element of testing in the Universal Protection concept, a separate call was provided for laboratory leaders by the chief medical officer.

Throughout, a COVID-19 newsletter and a centralized intranet website dedicated to COVID-19 news and resources served as main channels for communication. Overall, the Universal Protection Framework was communicated as a holistic approach to COVID-19 infection prevention.

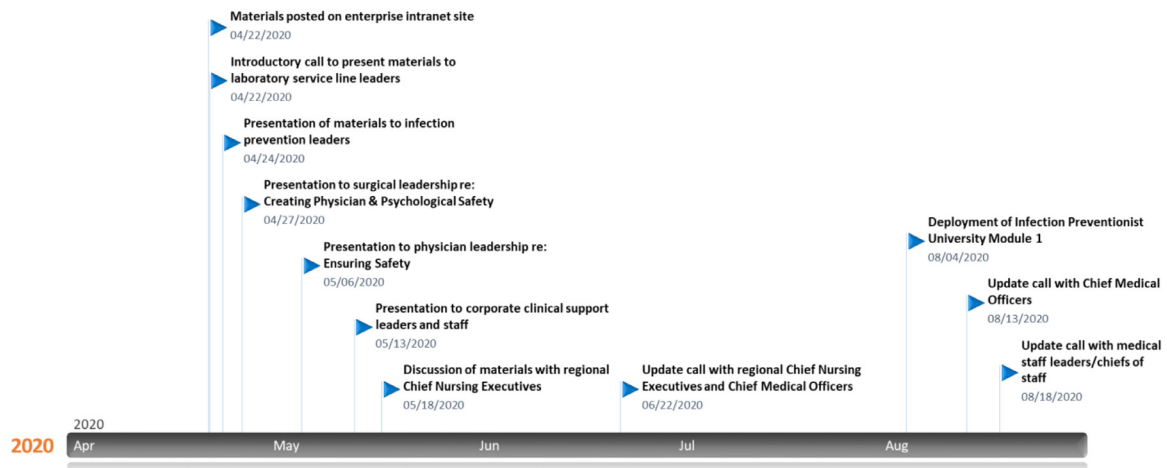


Figure 2: Shown here is the implementation time line for the Universal Protection Framework.

Implementation

The concept and expectations of the Universal Protection Framework were introduced across HCA Healthcare-affiliated sites of care, including inpatient facilities, ambulatory surgery centers, urgent care centers, and freestanding emergency departments. Both print materials and audiovisuals were used to disseminate information. Many centers customized presentation materials for their own facility, and many used the Universal Protection Framework on public-facing materials, such as an external website, to communicate with the lay community about the facility approach to safety during the COVID-19 pandemic.³

The framework was introduced to leaders across the organization through a series of virtual presentations and discussion sessions (Figure 2). These leaders used established communication channels to disseminate information to the applicable stakeholders. Any necessary updates to the materials that accompanied the framework were made at the enterprise level and stored in a centralized repository of COVID-19 resources. These changes were communicated via a weekly newsletter and presentations to key leaders (Figure 2).

Monitoring

Prior to the COVID-19 pandemic, support for best practice in facilities was via subject matter experts who worked across facilities, making periodic on-site visits. With the COVID-19 pandemic and the associated travel restrictions, a need arose for a new solution to implement and monitor best practices.

A survey instrument was designed to specifically evaluate and assess 46 separate domains (Table 1) with respect to implementation and use of the enterprise Universal Protection Framework and the Centers for Medicare & Medicaid Services COVID-19 Focused Infection Control Survey for Acute and Continuing Care.⁴ (For a copy of the survey, please contact the corresponding author.)

Regulatory and accreditation leadership collaborated with leadership from infection prevention, nursing services, patient safety, education, and clinical operations to develop the 46 elements to be surveyed during the virtual tracers.

A system was designed for administering the survey remotely through a combination of report review and virtual observation via videoconferencing, using an on-site leader as a navigator for the discussion. Partnership and collaboration with key stakeholders in the distribution and conduct of the survey was leveraged to drive execution. Each surveyor responsible for performing virtual surveys was educated and trained to ensure consistency in administering the virtual tracers and surveys. An electronic standardized checklist, inclusive of all 46 elements, to guide survey activity was implemented, requiring each surveyor to address and score as compliant or not compliant during virtual survey activities. The surveyors also had the ability to score items as “not surveyed” or “not applicable” as appropriate, based on the size, scope, and services offered by the hospital. As a forcing function, the survey software used to capture compliance does not allow for a survey to be completed or closed unless *all* assigned items are marked as compliant, not compliant, or not applicable. The standardized checklist was used across surveyors to ensure consistency in locations being surveyed during virtual review (for example, entrance screening, clinical units, break areas, cafeterias). Additional surveyor team members were required to observe multiple virtual surveys and then complete internal verification by surveyor team leadership through preceptorship before being able to independently survey. All 15 sites had two surveyor team members to support technology, serve as additional references, and provide consistent guidance between multiple surveyors.

The survey process was supported via a presurvey conference call outlining technology and staffing resources, including two to three available mobile devices and two to three survey facilitation teams. A standardized schedule

Table 1. Itemized Domains Assessed in the Remote Audit Process
<p>Leadership Oversight</p> <ol style="list-style-type: none"> 1. Leadership oversight of virtual visitation 2. Leadership oversight of social distancing in break areas 3. Escalation process for newly identified respiratory symptoms (in patients) 4. Cohorting of PUI/Positive patients in nursing units 5. Risk assessment performed in COVID-19 cohorted areas 6. Evaluation of outpatient settings and shared resources for COVID-19 patients (MRI, CT, etc.) 7. Time-blocking COVID-19 patient procedures to certain times of the day (end of day/last cases) 8. Dedicated staffing shift-to-shift of colleagues in COVID-19 units 9. Preventing overlap of high-risk patient populations and COVID-19 patients (respiratory therapy should not care for COVID-19 positive/PUI patients and immunosuppressed patients in the same shift) 10. Execution of social distancing guidelines in public spaces 11. Visible signage available prompting reminders of social distancing in public/common spaces 12. PPE oversight leadership team established 13. PPE task force oversight of distribution, accountability, etc. 14. PPE burn rates tracked 15. PPE task force leader oversight strategies (addressing reports of shortage, validation of handout process) 16. PPE task force leader communication strategies (burn rate communicated to facility and division leadership, daily huddle communications)
<p>Access and Screening</p> <ol style="list-style-type: none"> 17. Access control to facility 18. Screeners wearing appropriate PPE 19. First point of contact screening used by screening staff 20. Colleague/staff screening prior to shift 21. Patient screening processes and if/when positively screened 22. Visitor screening (if visitors allowed)
<p>Emergency Services</p> <ol style="list-style-type: none"> 23. Cohorting in emergency department if positive screened
<p>Surgical Services</p> <ol style="list-style-type: none"> 24. Pre-admit testing practices (preoperative) 25. Intraoperative care practices 26. Postoperative care practices (and cohorting)
<p>Foundational Infection Prevention Practices</p> <ol style="list-style-type: none"> 27. Universal masking of staff and providers 28. Universal masking of visitors, contractors, etc. 29. Food/drinks in clinical areas and shared food products in break spaces 30. Alcohol-based hand rub (ABHR) readily available 31. Hand hygiene performed appropriately 32. Cleaning of iMobile communication devices 33. Cleaning of iPads used for virtual visitation or translation services 34. Cleanliness of public spaces and restrooms 35. Public coffee/water/vending stations (cleaned frequently or out of service)
<p>Provision of Care for COVID-19 Positive/PUI Patients & PPE Assessment for Staff</p> <ol style="list-style-type: none"> 36. Adequate signage on room indicating need for transmission-based precautions 37. Assessment of social distancing on nursing units where possible 38. Donning of PPE in designated donning spaces (as applicable) 39. Just-in-time fit testing 40. Clustered/dedicated care strategies to minimize room entries (as appropriate) 41. Face shields/goggles cleaned between encounters 42. Non-aerosolizing procedure care PPE 43. Aerosolizing procedure care PPE 44. Environmental/engineering controls in aerosolizing procedure spaces (HEPA filtration, ventilation, number of persons in room)
<p>Employee Health</p> <ol style="list-style-type: none"> 45. Staff exposure tracking, monitoring, and follow-up
<p>PPE Extended Use/Reuse Strategies</p> <ol style="list-style-type: none"> 46. Cleaning, reprocessing, reusing PPE practices (as appropriate based on supply)
<p>PUI, person under investigation; PPE, personal protect equipment; HEPA, high-efficiency particulate air.</p>

with tracer activities and times for tracer activities was included in the presurvey discussion, as well as included with the videoconference invite. Survey facilitation teams included, at a minimum, one individual whose role was hold-

ing the device, one individual to record leading practices and identified opportunities for compliance, and a member of facility leadership. Nursing unit leadership was requested to participate while virtually touring selected units, along

Table 2. Results from Remote Monitoring of Universal Protection Framework

Most Frequently Cited Areas	
Challenges	Compliant
Social distancing in common areas	Systems for oversight personal protective equipment distribution and usage
Universal masking practice	Personal protective equipment distribution and conservation practice
Food, drink, shared items (such as magazines) in waiting areas	Appropriate cohorting of COVID-19 suspected or confirmed cases
Social distancing in staff break areas	Designated access to facility, with controls in place
Visible signage with infection prevention expectations	Systems for tracking employees after COVID-19 exposure

with staff members as appropriate for question-and-answer-type responses. As an additional protective measure, the platform for videoconferencing was vetted to ensure that all applicable regulatory requirements and security features were met. Company-issued mobile devices containing internally vetted protection software were the only devices deemed acceptable for use as part of the virtual surveys.

RESULTS

As of this writing, 15 remote assessments have been completed to evaluate compliance with Universal Protection. These remote assessments were conducted at a variety of facility types, including in areas with high COVID-19 activity, facilities with additional distributions of PPE, and a few facilities that volunteered to be surveyed. The convenience sample of 15 hospitals were located in nine states (Texas [4], Nevada, Missouri [2], Virginia, Tennessee, Florida [2], Kansas, Georgia, Louisiana [2]) and ranged in size from 157 operational beds to 834 operational beds. The median number of operational beds for included hospitals was 453. Each facility's survey was conducted during a single day; the first survey was conducted May 18, 2020, and the last survey was conducted June 24, 2020.

Overall compliance with the 46 survey domains for evaluation of framework elements ranged from 82% to 96%, with an average of 90% compliance. The responses to the survey identified top areas of high compliance and challenges to compliance. Table 2 outlines the top five areas of high compliance and challenges identified through the compliance assessment. Facilities demonstrated compliance with oversight and distribution of PPE, cohorting of COVID-19 patients, facility access controls, and employee exposure monitoring. However, foundational infection prevention practices such as social distancing and universal masking were found to be common process challenges during administration of the virtual review.

Qualitative and observational results such as the broad-based use of the framework in internal and public communications suggests that the framework provided a useful strategy for communicating safety measures in the COVID-19 era. The results of the compliance survey indicated areas for potential improvements. For instance, a significant chal-

lenge to compliance was the maintaining of appropriate physical distancing in certain areas, such as break rooms. The addition of forcing functions for social distancing was found to be important for practice consistency.

Challenges to remote survey activity were fewer than originally and subjectively anticipated. Surveyors did have to adapt to the new communication modality, which included being able to tell the team at the facility where/how to hold the device to ensure that the surveyor was looking at the appropriate person or place for the particular survey element. For example, if touring hallways or staff areas occurred, reminders had to be given to keep the device facing upright to ensure that passers-by were able to be observed for universal masking, hand hygiene, distancing in common areas, or other compliance elements.

CONCLUSION

The COVID-19 pandemic has required health care facilities to implement a daunting array of new infection prevention practices and maintain high levels of compliance to protect staff, visitors, and patients. Adjusting to numerous and changing guidelines is challenging, and to address this challenge HCA Healthcare adopted the approach of bundling these practices and implementing them as a Universal Protection Framework. In addition, the Universal Protection Framework is a key component of the resumption of elective surgical procedures, and complements the presurgical testing methods that have been developed to help ensure the protection of patients and health care workers.⁵

The need to evaluate compliance with the Universal Protection Framework in the midst of the pandemic spawned the development of a remote system for surveillance. The development of this new mechanism for remote monitoring allowed for the assessment of compliance with the framework while ensuring the safety of assessors and reducing potential exposure for staff and patients. In addition, this remote monitoring served as a mechanism to identify compliance challenges and provide feedback to facility leaders. These audits provided evidence that such remote monitoring strategies can be successful and may

prove useful after the unique challenges of the COVID-19 pandemic have passed.

The Universal Protection Framework represents a mechanism for presenting the complex and changing guidelines for COVID-19 infection prevention to facility leaders in an easy-to-implement format. We also believe that remote monitoring is on par with our previous compliance monitoring strategies, and this remote process will continue to have a role in our regulatory compliance program beyond the current environment.

Conflicts of Interest. The authors report no conflicts of interest.

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