BRIEF REPORT

A Health System Response to COVID-19 in Long-Term Care and Post-Acute Care: A Three-Phase Approach

Gina Kim, MD, MPH, Mengru Wang, MD, MPH,* Hanh Pan, MHA,† Giana H. Davidson, MD, MPH,‡§¶ Alison C. Roxby, MD, MSc,‖** Jen Neukirch, MHA, Danna Lei, MSN, FNP-BC,‡ Elicia Hawken-Dennis, RN,†‡ Louise Simpson, MHA,‡ and Thuan D. Ong, MD, MPH*‡*

See related editorial by Unroe in this issue.

BACKGROUND: The Seattle, WA, area was ground zero for coronavirus disease 2019 (COVID-19). Its initial emergence in a skilled nursing facility (SNF) not only highlighted the vulnerability of its patients and residents, but also the limited clinical support that led to national headlines. Furthermore, the coronavirus pandemic heightened the need for improved collaboration among healthcare organizations and local and state public health.

METHODS: The University of Washington Medicine's (UWM's) Post-Acute Care (PAC) Network developed and implemented a three-phase approach within its pre-existing network of SNFs to help slow the spread of the disease, support local area SNFs from becoming overwhelmed when inundated with COVID-19 cases or persons under investigation, and help decrease the burden on area hospitals, clinics, and emergency medical services.

RESULTS: Support of local area SNFs consisted of the following phases that were implemented at various times as COVID-19 impacted each facility at different times. *Initial Phase:* This phase was designed to (1) optimize communication, (2) review infection control practices, and (3) create a centralized process to track and test the target population. *Delayed Phase:* The goals of the *Delayed Phase* were to slow the spread of the disease once it is present in the SNF by providing consistent education and reinforcing infection prevention and control practices to all staff. *Surge Phase:* This phase aimed to prepare facilities in response to an outbreak by deploying a "Drop Team" within 24 hours to the facility to expeditiously test patients and exposed employees, triage symptomatic patients, and coordinate care and supplies with local public health authorities.

CONCLUSIONS: The COVID-19 Three-Phase Response Plan provides a standardized model of care that may be implemented by other health systems and SNFs to help prepare and respond to COVID-19. **J Am Geriatr Soc 68:1155-1161, 2020.**

Keywords: coronavirus; COVID-19; long-term care; nursing home; post-acute care

In the face of the rapidly evolving pandemic of coronavirus disease 2019 (COVID-19), post-acute care and long-term care facilities and other congregate living settings have been identified as high-risk settings for severe outbreaks and poor outcomes. These facilities are particularly susceptible as many of their patients and residents are frail, older adults and/or individuals with multiple chronic comorbidities or immunocompromised status.[1] Furthermore, staff members are frequently employed by multiple facilities, increasing the risk of spread. This vulnerability became more evident after the first outbreak in a skilled nursing facility (SNF) within King County, Washington, late February 2, 2020.[2] In response to this global outbreak and recent events within a SNF, the University of Washington Medicine's (UWM's) Post-Acute Care (PAC) Network proactively developed and implemented a standardized COVID-19 response plan to prepare its network facilities.

The UWM PAC Network was created in 2017 among 16 SNFs throughout King County in partnership with

From the *Division of Gerontology and Geriatrics, Department of Medicine, University of Washington, Seattle, Washington; †Office of the President, University of Washington, Seattle, Washington; ‡Post-Acute Care Services, University of Washington, Seattle, Washington; §Department of Surgery, University of Washington, Seattle, Washington; ¶Department of Health Services, University of Washington, Seattle, Washington; ‖Division of Allergy and Infectious Diseases, Department of Medicine, University of Washington, Seattle, Washington; and the **Department of Global Health, University of Washington, Seattle, Washington.

Address correspondence to Gina Kim, MD, MPH, Division of Gerontology and Geriatrics, University of Washington, Patricia Steel Memorial Bldg, 401 Broadway, Fifth Floor, Seattle, WA 98122. E-mail: gyskim@uw.edu

DOI: 10.1111/jgs.16513

0002-8614/20/$15.00

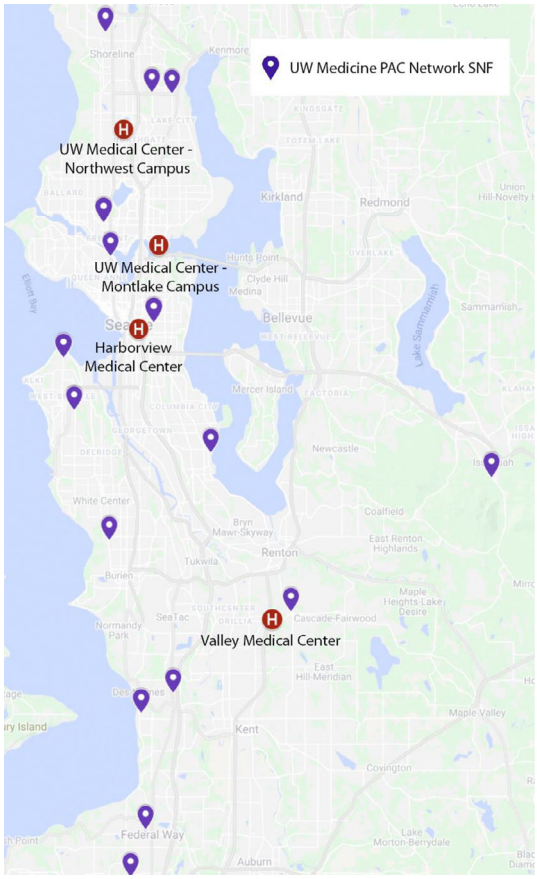

Figure 1. Geographic spread of Post-Acute Care (PAC) Network skilled nursing facilities (SNFs) and University of Washington Medicine's (UWM's) hospitals (created in Google maps).

UWM (Harborview Medical Center, UW Medical Center–Montlake and Northwest, and Valley Medical Center, as shown in Figure 1) to improve transitions in care and access to SNFs. SNFs were invited to join the UWM PAC Network based on historical volume of accepted UWM patients, quality performance measures, and on-site observations, as well as agreement to accept Medicaid patients, actively participate in monthly meetings, and implement shared protocols. Quality performance measures considered included readmission rates, staffing ratios and turnover rates, and tenure of medical director leadership. Currently, 6 attending doctors of medicine (MDs), 10 nurse practitioners, and 4 geriatric medicine fellows are on-site at the network facilities, with 1 MD in a medical director role. The PAC administration is composed of an administrator, program director, nurse manager, project manager, and program coordinator. SNF partners have access to UWM electronic medical records and increased coordination opportunities with hospital discharge planners. Through this preexisting partnership, several factors were already in place, including monthly meetings between UWM, key SNF staff, and on-site UWM PAC clinicians. Annual meetings with each SNF leadership and ad hoc meetings with SNF leadership to discuss patient care were also conducted.

It was only natural that the UWM PAC Network employ this partnership to rapidly develop and disseminate a standardized COVID-19 response to maximize knowledge and resources. The UWM PAC Network's response is based on the Centers for Disease Control and Prevention's (CDC's) *Preparedness Checklist* and *Infection Prevention and Control* recommendations.[3,4] The response involves three phases: *Initial*, *Delayed*, and *Surge*, shown in Figure 2. A timeline of the development and implementation of this response is shown in Figure 3. This document details elements of each phase as they were implemented in the UWM PAC Network facilities. By sharing this response plan, our hope is to help other SNFs and health systems to: (1) serve as an effective model of care, (2) decrease burden on local acute care hospitals, clinics, and emergency medical services (EMSs), and (3) decrease spread of communicable disease as a public health service.

INITIAL PHASE

The *Initial Phase* of this intervention is the broadest in scope, with goals to (1) optimize communication, (2) review infection control practices and personal protective equipment (PPE) utilization, (3) create a centralized process to track and test the target population, (4) implement surveillance protocols for persons under investigation (PUIs), and (5) plan for an outbreak. It is critical in this phase to review updated current guidelines from the CDC and the Centers for Medicare and Medicaid Services given the rapidly evolving understanding of COVID-19.

Communication

Our intervention started with introducing all SNFs within the UWM PAC Network to the three-phase approach via video conference. This was followed by individual on-site visits involving key personnel, including administrators, directors of nursing, resident care managers, infection control nurses, and medical directors. In this initial meeting, we assigned a point of contact (POC) for testing of staff and patients, reviewed current and best practices for infection control, and shared protocols for testing, surveillance, and triage. We shared contact numbers of POCs from the SNF sites and leads from the UWM PAC Network. It was important to communicate to the SNFs that a health system was available to support and advocate for their needs.

Testing and Tracking

Rapid turnaround times for testing are critical to allow for cohorting of patients and conservation of PPE. UWM has not historically performed laboratory testing on SNF patients unless it occurs on UWM campuses. However, SNFs had limited access to COVID-19 testing, and turnaround time from SNF site vendors varied between 5 and 7 days. Thus, a system was created allowing SNF sites to test all symptomatic patients and employees regardless of them belonging to the UWM Health System. A centralized registry of patients in the population of interest was created that allowed for rapid test result notifications to be provided to respective facilities within 24 hours. This centralized registry was key as often there are multiple medical groups or providers in a facility, which can lead to barriers

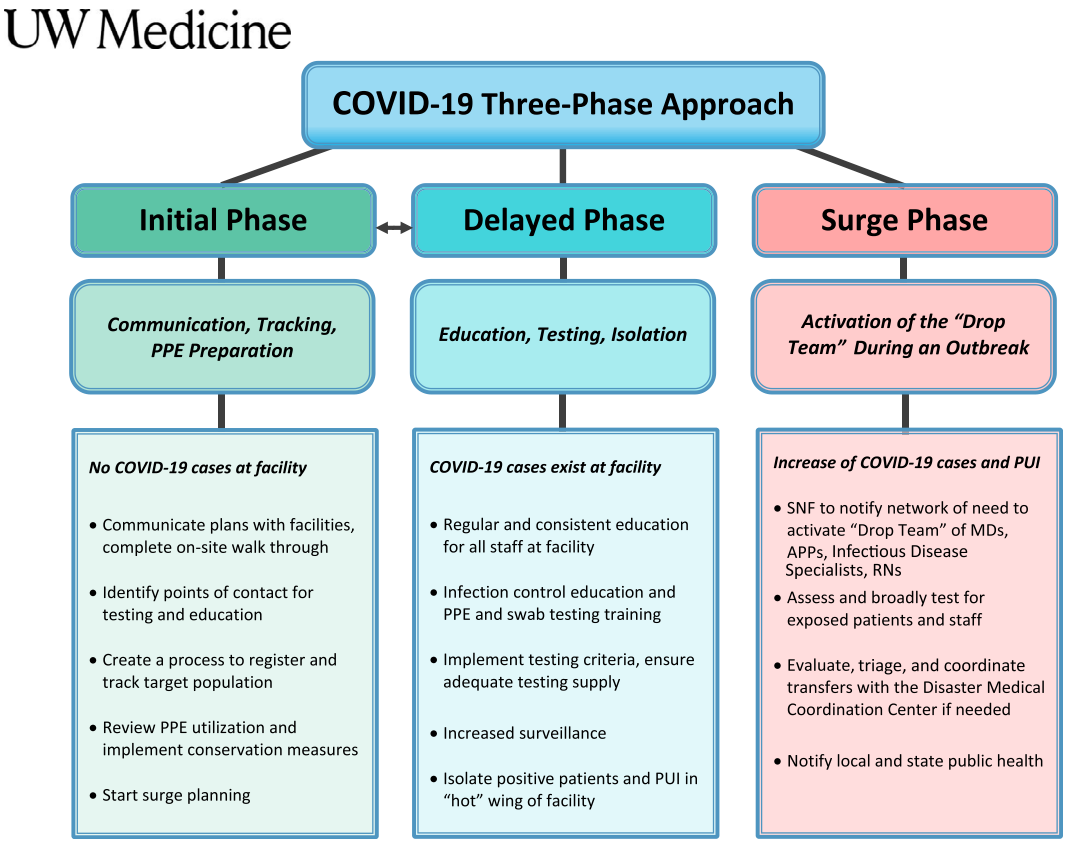

Figure 2. Three-phase approach to coronavirus disease 2019 (COVID-19). MD, doctor of medicine; APP, advanced practice provider; PPE, personal protective equipment; PUI, person under investigation; RN, registered nurse; SNF, skilled nursing facility. [Color figure can be viewed at wileyonlinelibrary.com]

in ordering and notification of test results. Patients managed under medical groups outside of UWM were offered registration preemptively or on an as-needed basis with UWM to expedite testing. We found that every SNF in our network with out-of-network patients chose to preemptively register with UWM. A standardized tracking log was provided to each facility to follow testing status and location of patients. Collected samples at the SNF sites were then dropped off by UWM PAC staff at the nearest UWM Neighborhood Clinic, where a preexisting courier system was used to deliver the samples to the main virology laboratories. This reduced the burden on SNF staff and helped ensure rapid turnaround times. As of mid-April, UWM extended its testing algorithm to include COVID-19 screening for all SNF employees within the UWM network. Employees were provided a dedicated hotline to coordinate scheduled testing at UWM drive-through sites.

PPE Preparation

The availability of PPE is a critical piece of the COVID-19 response. We provided education on the PPE required for general care of PUIs and COVID-19–positive patients, and commonly encountered situations in SNFs where an N95 or powered air-purifying respirator is required (eg, for nebulizer treatments or noninvasive positive pressure ventilation). Conservation policies were provided to facilities, including recommendations on bundling of care, transitioning to telemedicine visits when possible, logging of PPE inventory, and secure storage of PPE (Supplementary Text S1). We attempted to standardize the measurement of "days on hand" of PPE to specifically refer to the amount of days of PPE that were available to take care of five patients in private rooms who require droplet/contact precautions. This helped each facility and our network to measure and monitor PPE consumption, known as the PPE "burn rate," to better inform utilization and remaining PPE availability.[5] The number of sets of PPE used per day per patient was variable but was on average 10 to 14 sets. We worked to troubleshoot aspects of daily care to reduce that number.

Surge Planning

The initial on-site visit included surge planning with key SNF personnel to develop a plan for the isolation of COVID-19 PUIs to entire floors or units and changes to staffing and delivered services. SNFs were made aware of a contingency plan to involve the Northwest Healthcare Response Network and the local area Disaster Medical Coordination Center when needing to transfer out more than three patients at a given time, to ensure that no single emergency room would be overloaded with an acute influx of patients.

DELAYED PHASE

The goals of the *Delayed Phase* were to slow the spread of the disease once it is present in the SNF by providing

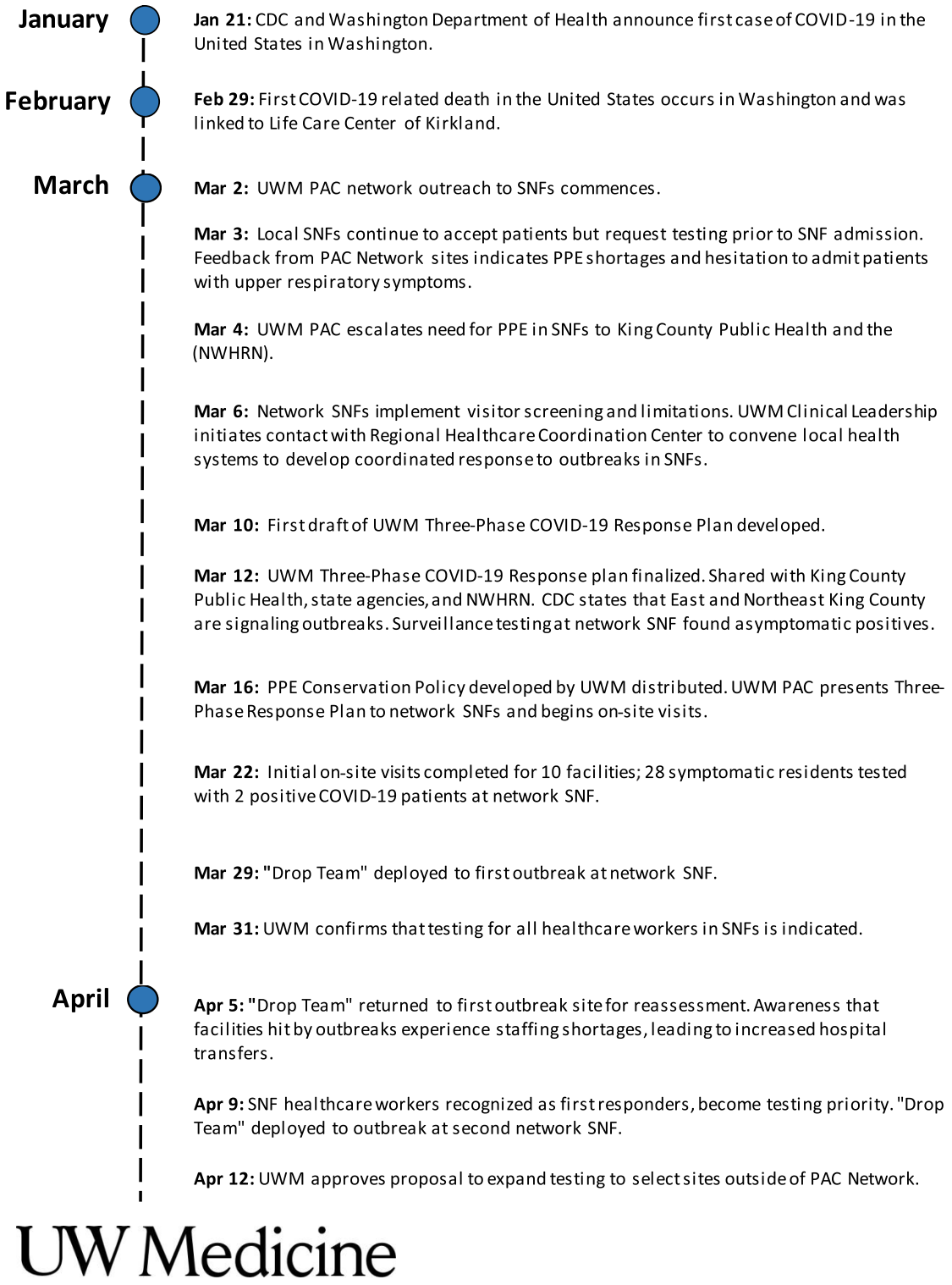

Figure 3. University of Washington Medicine's (UWM's) Post-Acute Care (PAC) response timeline. CDC, Centers for Disease Control and Prevention; COVID-19, coronavirus disease 2019; NWHRN, Northwest Healthcare Response Network; PPE, personal protective equipment; SNF, skilled nursing facility. [Color figure can be viewed at wileyonlinelibrary.com]

consistent education and messaging for staff on COVID-19, on-site observation and feedback on infection control practices and PPE use, and implementation of testing, surveillance, and triage.

Education

Education was provided to all staff on infection control basics, PPE training, and clinical signs and symptoms of COVID-19. Selected staff were trained in nasopharyngeal swab collection techniques, using protocols developed by the UWM (Supplementary Text S2). Videoconference virtual town hall meetings were held for all staff at SNF sites to combat misinformation and ease anxiety. These virtual town halls were run by UWM PAC clinicians on a regular basis in the evenings to provide practice updates and address staff questions. The UWM PAC clinical team also increased the frequency of meetings to weekly to discuss challenges and barriers encountered while caring for patients. Updates regarding testing procedures were provided during these meetings to disseminate throughout the UWM PAC Network.

Surveillance

Implementation of systematic surveillance with a focus on early identification of subtle changes in patient condition was requested for all facilities if not already in place. All patients were required to have vital signs, symptom screen, and assessment of patient appearance performed twice per day. Concerning features of appearance included flushed face and puffy eyes, and symptoms of concern included cough, sore throat, and shortness of breath. Triggers for closer surveillance included a temperature greater than 99°F or pulse oximetry lower than 3% of baseline (based on observations from Life Care Center of Kirkland), which would require repeated monitoring within 1 hour. Sustained abnormalities prompted a notification to the nursing supervisor and determination by the facility medical director as to whether the patient should be transferred to a hospital for evaluation or remain under surveillance, as shown in Figure 4.

Testing Protocol

UWM established guidance on testing criteria and provided this information to PAC Network SNFs. Initially, on-site testing capacity was limited, allowing only for testing of symptomatic patients and employees. By mid-April, local testing capacity was expanded to include screening for all SNF employees through UWM drive-through sites. Our testing protocol included a nasopharyngeal swab for COVID-19 as well as rapid swab for influenza and respiratory syncytial virus, as influenza was still circulating in the community. Each facility was provided with test kits, with a recommended minimum number of kits to hold on-site. If below the minimum number of kits, the site would contact the lead at UWM PAC to receive more kits. SNF sites performed their own tracing of COVID-19–positive employees to identify SNF patients

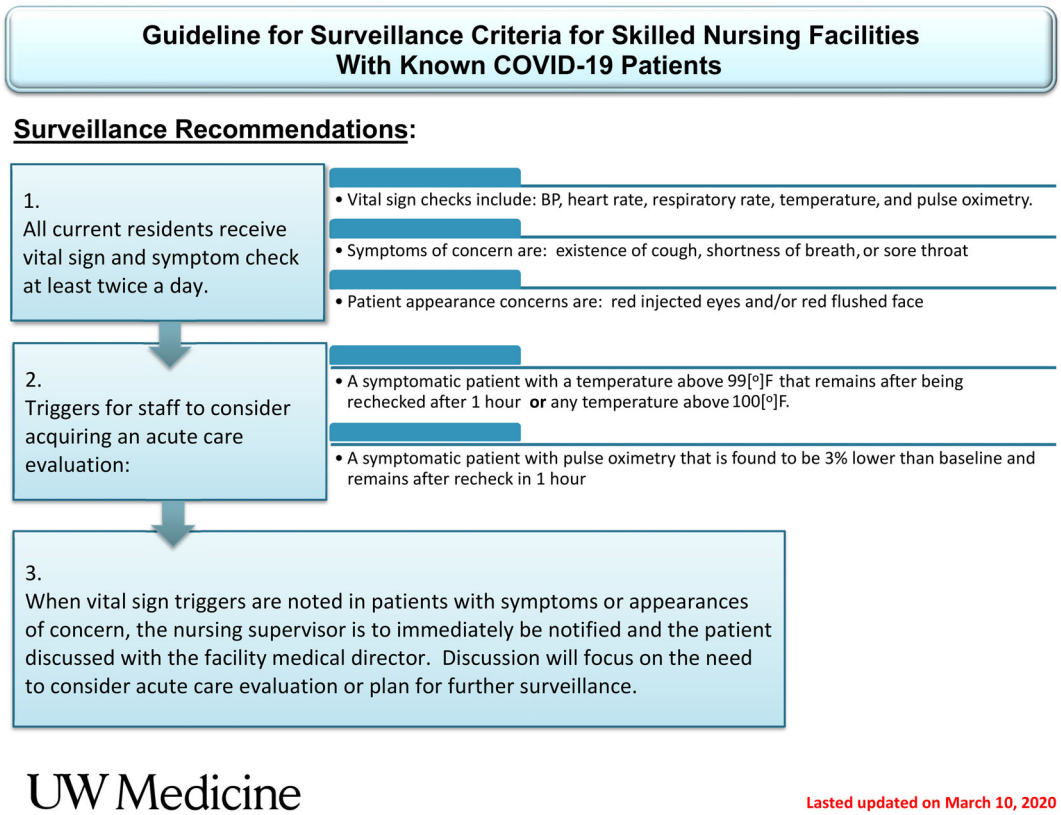

Figure 4. Surveillance algorithm for skilled nursing facilities with known coronavirus disease 2019 (COVID-19) patients. BP, blood pressure. [Color figure can be viewed at wileyonlinelibrary.com]

and other employees who may have encountered the affected person.

Isolation

As COVID-19 cases increased at SNF sites, there was a need to provide guidance on pragmatic isolation measures, balancing staffing, physical facility layout, and PPE shortages. SNF administration, on-site UWM clinicians, and UWM PAC leadership worked collaboratively to test patients and to develop a "hot" wing/unit dedicated to COVID-19–positive patients, which would permit use of a single set of PPE. COVID-19–positive patients were placed into private rooms or cohorted with other positive patients.

SURGE PHASE

The *Surge Phase* describes the response to an outbreak in a facility, where the number of PUIs exceeds the ability of the current SNF staff to clinically assess, test, and provide care. In this phase, a "Drop Team" of volunteer PAC clinicians (MDs and advanced practice providers), registered nurses, as well as an Infectious Disease provider were deployed to the facility to expeditiously test patients and exposed employees, triage symptomatic patients, and coordinate needed care and supplies with local public health authorities.

The "Drop Team"

The facility is responsible for notifying the UWM PAC lead when it is experiencing a surge in PUIs and needs a "Drop Team" activated. The SNF identifies and communicates the number and location of patients with COVID-19 positivity and PUIs and the number of exposed employees who would need testing. The "Drop Team" is mobilized within 24 hours with team size varying according to the needs of the SNF. Prelabeling of specimens and planning for the most efficient method of testing and triaging occurred the day before deployment with on-site administration.

Tandem Testing

Testing of SNF patients occurred in tandem within the facility to conserve PPE. Teams of two, composed of a "hot" and a "clean" person, systematically tested patients moving through a preplanned route with necessary equipment on a cart. The "hot" person collected the sample inside the room, while the "clean" person handled the door and collection outside of the room. The "clean" person observed the "hot" person doffing and donning to prevent contamination (Supplementary Text S3). Employee testing was performed outside of the facility with a drive-through and a walk-up set up as some SNF healthcare workers may not have access to a vehicle. Employees were assigned testing times to control testing flow.

Triage

Triage was determined with consideration of the patient's vital sign trend, clinical symptoms, code status, and medical comorbidities, with attention to pulmonary and cardiac comorbidities. For symptomatic patients with COVID-19–positive status or pending test results with Do Not Resuscitate (DNR) status, goals of care conversations were held with patients and their families to clarify preferences on hospital transfer. Symptomatic COVID-19–positive patients with DNR and Comfort Measures Only status were discussed with the clinical team and family for consideration of hospice referral. Goals of care were also revisited for symptomatic COVID-19–positive patients with Full Code status.

Notification

Redundancy was created to ensure that COVID-19 results were not missed. SNF sites were provided a tracking tool to log the COVID-19 tests submitted and results. At the time of writing, further plans are being developed for results to automatically be sent to the SNFs from the UWM Laboratory. The UWM PAC Network coordinated with SNFs the reporting of COVID-19–positive patients and employees to local and state public health officials as well as PPE shortages and other supply chain concerns.

EARLY LESSONS LEARNED

Centralized Monitoring Body

An important early lesson was identifying the need for a command center to aid distressed SNFs and other congregate living environments in the deployment of information and resources. As COVID-19 cases emerged in SNFs throughout King County and surrounding areas, it became clear that a command center was needed to monitor surging cases, supply chain challenges, staffing shortages, and diagnostic and clinical support. The existing relationship and communication between the SNFs and local and state public health officials, who also act as the SNF regulatory body, should be improved to help achieve mutual goals and shift from punitive actions. Local and state public health are not uncommonly viewed by SNFs as regulatory bodies focused on compliance with governmental rules and policies. Establishing sympathetic, mutual goals for desired patient outcomes and reducing the fear of punitive measures for SNFs to promote accurate reporting and requests for assistance would be a critical step in building trust. UWM PAC worked in collaboration with our network SNFs and local public health to communicate outbreaks, PPE supply needs, and staff shortages. At the time of this writing, as our network SNFs are stabilizing in their response to COVID-19, we have begun to extend our services to nonnetwork SNFs, prioritizing facilities with the highest hospital discharge volumes.

Telemedicine

The implementation of telemedicine into the SNF environment where there can be limited technology and information technology support posed early challenges to our network. An early lesson learned would be to incorporate a telemedicine readiness assessment survey for SNF leadership to better understand existing technological and staffing capabilities. Within our network, there was variable technological access in place, leading to delays in implementation.

SUMMARY

The COVID-19 Three-Phase Response Plan provides a standardized model of care that may be implemented and adapted by other health systems to help prepare and respond to COVID-19. The *Initial Phase* focuses on optimizing communication, reviewing current infection control practices, and creating a centralized process to track and test the target population. The *Delayed Phase* provides education and reinforces infection prevention and control practices to all staff. The *Surge Phase* aims to adequately prepare facilities to respond to an outbreak, by deploying a "Drop Team" within 24 hours when needed. These phases are not mutually exclusive but are designed to enhance measures and activities that were previously enacted. We anticipate fluidity among the phases as needed and evolution of the response plan as the pandemic affects supply chains and impacts staffing. Having an established relationship with partnering SNFs undoubtedly provided a level of trust that allowed for effective coordination and delivery of services. By sharing the Three-Phase Response as well as lessons learned while implementing this plan throughout the UWM PAC Network facilities, we believe this model will help other SNFs and health systems decrease spread of this communicable disease as a public health service and decrease the burden on local acute care hospitals, area clinics, and EMSs.

ACKNOWLEDGMENTS

We thank Steven H. Mitchell and Sabine von Preyss-Friedman for their contribution to the surveillance protocol.

Conflict of Interest: This research received no specific funding/grant from any funding agency in the public, commercial, or not-for-profit sector. The authors declare no conflicts of interest.

Author Contributions: Thuan D. Ong, Danna Lei, Hanh Pan, Giana H. Davidson, Alison C. Roxby, Jen Neukirch, Elicia Hawken-Dennis, and Louise Simpson conceived, designed, and implemented the intervention. Thuan D. Ong, Giana H. Davidson, Gina Kim, and Mengru Wang participated in implementation of the intervention and the drafting of the manuscript. All authors contributed to the review of the manuscript.

Sponsor's Role: This research was not sponsored by any entity.

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SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article.

Supplementary Text S1: Sample personal protective equipment conservation policy.

Supplementary Text S2: Sample nasopharyngeal swab protocol.

Supplementary Text S3: Sample testing in tandem protocol.