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EDITORIAL

AN ASPIRATIONAL APPROACH TO NURSING HOME OPERATIONS DURING THE COVID-19 PANDEMIC

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Abstract: COVID-19 has infected nearly half of all nursing homes in the United States. Tens of thousands of residents have lost their lives, and many more have been hospitalized. Emerging data suggest that few nursing facilities have the organizational structure, training, resources, physical plant, and operational capability to keep the COVID-19 infection completely out of a facility. Key infection prevention strategies (such as cohorting, universal masking of patients/staff, focused ventilation, point-prevalence testing, and preventing movement of healthcare workers between facilities) have been inconsistently and haphazardly applied. With these challenges in mind, the California Association of Long Term Care Medicine (CALTCM) proposed a model for a virtual centralized Support and Guidance Center that develops and disseminates real-time expert-driven recommendations to the traditional organizational structure of a nursing facility. We recommended that all senior congregate facilities transition to an incident command management structure. This would allow local leadership teams to focus on day to day management, transferring the responsibility of training, PPE procurement, engineering, testing, and real-time expert-driven recommendations to a centralized entity. Clinical and operational aspects of this model are based on emergency preparedness principles. While this approach is aspirational, the principles delineated in this document can be used to guide policy decisions as we work to mitigate the impact of this virus.

Key words: Coronavirus, COVID-19, cohorting, mitigation, incident command.

Background

COVID-19 has been particularly devastating in senior congregate living facilities around the world (1). Two thirds of nursing homes in the United States have known cases (2). As of June 15th, 2020, there were over 150,000 documented or suspected infections, and nearly 32,000 deaths. The true burden of disease may be much higher. Traditional infection control efforts have had limited success in reducing the spread of disease (3). Emerging data suggest that few nursing facilities have the organizational structure, training, resources, physical plant, and operational capability to successfully keep the COVID-19 infection completely out of a facility (4, 5).

Nursing homes have struggled with infection prevention historically, and COVID-19 has amplified this challenge (6). Lack of Personal Protective Equipment (PPE) was a significant risk factor for poor outcomes in nursing homes with major outbreaks, as seen in Spain and other countries (7). Reports of severe staffing shortages and patient abandonment emerged. Management teams often had to work double or triple shifts to fill in for sick staff, impacting their ability to react to a rapidly escalating crisis.

Key infection prevention strategies are being applied inconsistently and haphazardly. For example, despite expert recommendations and government mandates, point-prevalence testing has not been readily available in nursing homes.

There have been efforts at implementing a more comprehensive strategy for disease mitigation. The University of Washington Medicine's Post-Acute Care Network developed a three-stage response plan for nursing facilities (8). Their approach took into account many of the challenges faced by nursing homes and provided responses to assure that facilities met the key best-practice elements.

CALTCM developed several consensus documents, including the Long Term Care Quadruple Aim for COVID-19 Response (9). Crucial recommendations included ensuring that all facilities meet the same high standard in four spheres of COVID-19 management: 1) PPE, 2) Testing, 3) Infection control best-practices 4) Emergency response system.

Other recommendations included a model for a virtual centralized Support and Guidance Center that disseminates real-time expert-driven recommendations to the traditional organizational structure of a nursing facility, as well as transition to an incident command management structure (a validated disaster response system that has been widely implemented in the US and elsewhere).

This article reviews current recommended COVID-19 mitigation measures and lays out a framework for how senior congregate living centers can be supported in their efforts to protect residents and staff.

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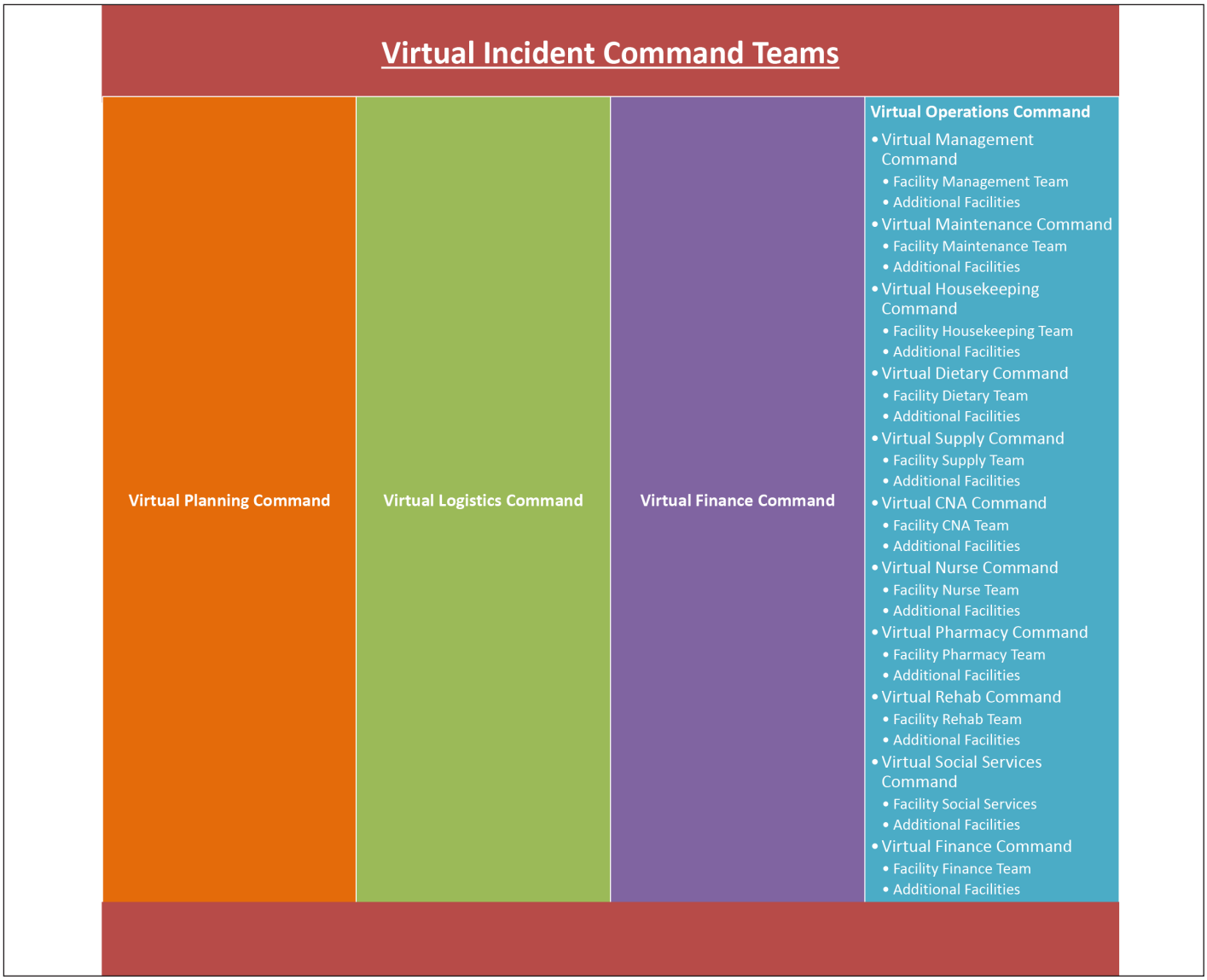
Figure 1
Virtual Support & Guidance Center



Mitigation measures

Cohort COVID-19 patients

Cohorting COVID-19 positive patients is important for those who require a skilled nursing level of care. Proper cohorting has several potential advantages, including reduced PPE usage, staff specialization, ability to implement standardized COVID-19 care protocols, and infection control. In the New England Journal of Medicine, Drs. McMichael, et al. conclude "proactive steps by …facilities to identify and exclude potentially infected staff and visitors…are needed to prevent the introduction of Covid-19" (10). Drs. Grabowski and Joynt also make the case supporting the concept of COVID-19 Positive Postacute Centers in their JAMA article, "Postacute Care Preparedness for COVID-19 (11). This same concept may also be applicable to separate wings in a traditional nursing home.

Any effort to move existing residents to create a COVID-19 cohorted space or dedicated facility must involve careful planning in order to minimize the risks of uprooting frail seniors from their homes. First, transfer trauma is a well-documented potentially life threatening phenomenon among nursing home residents (12). Second, the virus may be unwittingly introduced into the receiving facility (13). Third, there is no guarantee that the facility that they are moved to will be COVID-19 negative (14). Fourth, transitions such as these are known to introduce an increased risk of medical errors and potential harm (15, 16). To move residents from one facility to another without a clear plan and structure in place has proven to be problematic (17). Any effort must effectively integrate

the knowledge and understanding of the nursing home industry (18).

Onsite full-time infection preventionist and medical director coverage

Each facility needs a full-time infection preventionist (IP). This staff member would help train and audit staff, implement new infection control practices, monitor PPE supplies, and serve as a liaison to a regional infection prevention network. Prior to the COVID-19 Pandemic, the Centers for Medicare and Medicaid (CMS) had been considering reducing the requirements for infection preventionists (19). On March 20th, the Board of Directors of CALTCM recommended that a full-time IP be mandated in California. On May 11th, an "All Facilities Letter" from the California Department of Public Health recommended a full-time equivalent of an Infection Preventionist as part of a nursing facility's mitigation plan (20).

The presence of certified medical directors (CMDs) is an independent predictor of quality in nursing homes (21). As a pandemic requires the engagement of medical experts, nursing homes must fully engage their medical directors in providing safe, compassionate and up-to-date care and treatment to their residents. While it may not be realistic at this time to have a full-time certified medical director in every facility, certified medical director expertise could be leveraged using virtual platforms under the ICOS framework described below.

Testing

We recently convened an expert Delphi panel that strongly recommended regular proactive point-prevalence testing in nursing homes (22). COVID-19 positive seniors often present atypically and require a high index of suspicion for disease (23, 24). Younger staff may be asymptomatic (25). Without widespread testing, the virus can spread rapidly, with potentially devastating effects (26). Reports from congregate living facilities in Los Angeles and Washington State have validated the importance of proactive testing (27, 28).

In our framework, all residents and staff should promptly undergo baseline COVID-19 testing for active infection. Retesting of staff and any residents who leave the building for treatment or other appointments should be prioritized. The testing frequency still needs to be further defined, and will certainly be informed by emerging data and experience.

Universal masking

Nearly 600 healthcare workers in the US have died from COVID-19 (29). Nosocomial transmission has been documented and is thought to be a major contributor to spread of COVID-19 in congregate living settings (30).

Masking is a crucial infection prevention strategy for COVID-19 (31). We recommend universal masking of all residents and staff in nursing homes, regardless of COVID-19 status. Residents can use cloth or surgical masks and wear them when interacting with caregivers, while staff should use n95 respirators if available (32).

Physical plant modifications

Respiratory aerosols with COVID-19 viral particles can remain suspended in the air for several hours, and airborne transmission may to be a dominant mode of disease transmission (29). As per CDC recommendations, efforts should be made to increase outdoor air circulation within buildings. Break rooms and other common spaces for staff need to be reconfigured to encourage social distancing.

If creating COVID-19 only wings within larger facilities, separate egresses and entrances should be created, and staff (in addition to patients) should be cohorted away from COVID-19 negative units.

Virtual support and guidance incident command center framework

In our experience, the amount of external logistical support given to nursing homes is often less dependent on the actual need and more dependent on the strength of the local public health department and health system leaders. Some facilities have received testing supplies, PPE, and staffing, while others have been left largely on their own. This has a created a haphazard and uneven response with predictably variable clinical outcomes.

The complex, resource intensive requirements of nursing home management during this pandemic lends itself well to an incident command system framework. Addressing this challenge is at the core of the ICOS model. ICOS stands for Infrastructure, Clinical, Operations and Staffing. It can be quickly operationalized at the regional level, leveraging virtual technologies to provide real time expert support and guidance to every nursing home simultaneously.

Infrastructure

During natural disasters, entities such as FEMA, the Army Corp of Engineers, Army Medical Corps and regulatory bodies coordinate the building, retrofitting, and supplying of temporary housing or health facilities for those who need it. While there is clearly a need to house COVID-19 positive older adults in cohorted settings, agencies that are ready and prepared to act on this do not have a full understanding of what is required to create successful, efficient, safe spaces that provide the intermediate level of assistance with basic activities of daily living that nursing homes provide. It is essential that these bodies effectively interact with skilled nursing facility clinical and operational experts to create a standard template and to effectively coordinate the repurposing and creation of COVID-19 positive facilities or wings.

Modeling algorithms are being created to determine the number of stand-alone facilities needed to meet the expected demand. In the meantime, it seems necessary to create and

repurpose existing space as nursing homes become de facto COVID-19 facilities. We question the rationale of using facilities with significant COVID-19 outbreaks to take on the role of becoming COVID-19 Positive Post-Acute Care Centers just on the basis of having outbreaks already existing there, unless there are clear and scientifically based guidelines to assess the readiness of such facilities (33). Current literature and clinical experience suggest that policy decisions that do not effectively take readiness into account will not mitigate morbidity and mortality, and in fact are likely to exacerbate the loss of life by increasing the number of cases of the illness in this highly vulnerable population.

Adequate stores of PPE and perception of adequate supplies are critical to a skilled nursing facility's ability to defend against the COVID-19 infection (34). We also need to engage the use of technology that allows for the delivery of clinical care and finding ways to increase socialization while minimizing transmission of the virus.

Clinical

The Clinical component of the ICOS proposal recognizes that the COVID-19 infection brings with it little in the way of evidence-based research and experience. It is necessary to use real-time clinical experience and incorporate a modified Delphi process to develop an approach to care (35). It's not enough to have Delphi-based guidelines, however. To deliver true person-centered care during this pandemic means that we must also contextualize the decision-making process (36). Our solution to this challenge is the development of multidisciplinary groups of experts working with the Society for Post Acute and Long Term Care Medicine (AMDA), CALTCM, and other organizations. These expert panels can incorporate feedback from clinicians in the field who are dealing with COVID-19 outbreaks. A normal modified Delphi process might take several months. In a pandemic, that time frame must be reduced as best practices change rapidly.

This type of process is already guiding decision-making in the field around the country; it just has not been formalized. There is a clear opportunity to develop guidance in real time for COVID-19 positive patient medical care. These expert-supported clinical recommendations can be developed in real time for policy makers, as well as for Directors of Nursing and Medical Directors. An example of a recommendation that has come out of this process is the development of testing recommendations (37). As expert clinical recommendations are developed, they can be delivered back to the COVID-19 skilled nursing homes through weekly webinars/briefings.

Operations

The typical nursing home utilizes a hierarchical organizational structure with the nursing home administrator (NHA) serving as the chief executive of a single facility. The training of NHAs is unlikely to have prepared them for the COVID-19 pandemic. It is critical that nursing homes immediately shift into their emergency preparedness policies and procedures, which means that facilities must function in an incident command mode. The idea of a "morning stand-up" meeting where the NHA meets with all of the department heads is no longer sufficient to manage this crisis.

In a pandemic, each department in a NH needs up-to-date, actionable information that is unlikely to be effectively shared through the traditional chain of command structure and function. Instead, a virtual Support and Guidance Center that would provide operational multidisciplinary teams led virtually by experts would provide daily management guidance to each department for a number of facilities at the same time.

The virtual Support and Guidance Center is set up by department, following a traditional NH organizational chart. The departments represented are as follows:

- Incident Commander: NHA
- Incident Management Team: NHA, DON, Medical Director, Infection Preventionist (IP)
- Physical Plant/Maintenance
- Housekeeping
- Dietary
- Central Supply-logistics
- CNAs
- Licensed Nurses
- Pharmacy
- Rehabilitation
- Social Services & Activities
- Admin/Business Office/Finance

Experts comprising each department in the virtual Support and Guidance Center would develop actionable recommendations through a modified Delphi expert approach. They would feed this information daily back to facility department heads. This information would also be shared regularly and integrated with individual facility incident command teams.

It is critical to reiterate that a pandemic of the nature of COVID-19 necessitates the development of incident command approaches that shift facility staff from "drinking information from a firehose," to getting them information that they can ingest through a straw. We recommend avoiding one-on-one education and training interactions as much as possible, as this is not a scalable solution to overseeing nursing homes challenged by COVID-19 infections.

Staffing

It is critically important that facilities have adequate staffing to meet the needs of their residents. Staffing shortages due to high rates of infection (and fear of infection), have resulted in patient needs going unmet. In cases where large numbers of staff became ill, federal and state entities such as the National

Guard and Army Medical Corps have assisted, but this is not a long-term solution.

Certified Nursing Assistants (CNAs) are the clinical backbone of nursing homes. The main requirement for CNAs is that they are caring human beings. There appear to be models occurring throughout the country that provide for on-the-job training, and these programs need to be expanded. Licensing and certification regulations should be relaxed and streamlined to allow for on-the-job training. Hazard pay may need to be added to entice more workers to sign on.

Many facilities have already instituted efforts to reduce unnecessary tasks that consume nursing time, such as unnecessarily frequent vital signs and deprescribing unnecessary medications. Additional time in COVID-19 Positive Post-Acute facilities will be required with donning and doffing PPE and related tasks. Nursing homes should not be expected to take on more residents than those for whom they can safely provide care and treatment.

Some researchers have suggested specific recommendations for nursing staffing ratios, and certainly anytime the acuity level of a facility's case mix increases, the need for nursing hours will also increase (38, 39, 40). The ICOS structure can help ensure adequate staffing for nursing homes during this crisis.

A CMS study in 2001 established the importance of having a minimum of 0.75 registered nurse (RN) hours per resident day (hprd), 0.55 licensed nurse (LVN/LPN) hprd, and 2.8 (to 3.0) certified nursing assistant (CNA) hprd, for a total of 4.1 nursing hprd to prevent harm or jeopardy to residents. As part of this study, a simulation model of direct care workers (CNAs) established the minimum number of staff necessary to provide five basic aspects of daily care in a facility with different levels of resident acuity. A more recent study shows that for the highest acuity nursing homes, CNA staffing should be 3.6 hprd (41). For the lowest resident workloads, this converts to 1 CNA for every 7 residents on the day and evening shifts and 1 CNA to 11 residents at night. For the heaviest resident workloads, 3.6 CNA hprd converts to 1 CNA for 5.5 residents on days and evenings and 1 CNA for every 11 residents on nights.

A number of organizations have endorsed the minimum of 4.1 hprd standard, and have suggested that at least 30 percent of hours should be provided by RNs and LVNs/LPNs and facilities should have 24-hour RN care (42, 43, 44). Some experts have recommended even higher staffing standards (a total of 4.55 hprd) to improve the quality of nursing home care, with higher adjustments for higher resident acuity (45). Recent studies have shown a correlation between RN staffing and COVID-19 outcomes (46, 47).

Conclusions

COVID-19 demands a well-reasoned, evidence-based approach to nursing home management. The resources and guidance provided by a centralized virtual support and guidance center can also be utilized to stem the tide of the COVID-19 infection in all nursing homes simultaneously. This involves real-time dissemination of best practices through an incident command-driven model developed specifically to stop the spread of this deadly pandemic and to limit the morbidity and mortality in the most vulnerable members of our population.

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