



COVID-19 in Nursing Homes: Calming the Perfect Storm

Joseph G. Ouslander, MD* and David C. Grabowski, PhD†

The pandemic of viral infection with the severe acute respiratory syndrome coronavirus-2 that causes COVID-19 disease has put the nursing home industry in crisis. The combination of a vulnerable population that manifests nonspecific and atypical presentations of COVID-19, staffing shortages due to viral infection, inadequate resources for and availability of rapid, accurate testing and personal protective equipment, and lack of effective treatments for COVID-19 among nursing home residents have created a “perfect storm” in our country’s nursing homes. This perfect storm will continue as society begins to reopen, resulting in more infections among nursing home staff and clinicians who acquire the virus outside of work, remain asymptomatic, and unknowingly perpetuate the spread of the virus in their workplaces. Because of the elements of the perfect storm, nursing homes are like a tinderbox, and it only takes one person to start a fire that could cause many deaths in a single facility. Several public health interventions and health policy strategies, adequate resources, and focused clinical quality improvement initiatives can help calm the storm. The saddest part of this perfect storm is that many years of inaction on the part of policy makers contributed to its impact. We now have an opportunity to improve nursing homes to protect residents and their caregivers ahead of the next storm. It is time to reimagine how we pay for and regulate nursing home care to achieve this goal. *J Am Geriatr Soc* 00:1-10, 2020.

Keywords: nursing homes; SARS-CoV-2; COVID-19

THE PERFECT STORM

The pandemic of viral infection with the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) that

causes COVID-19 disease has put the nursing home industry in crisis.¹ Viral infection and COVID-19 disease are prevalent among older nursing home residents. The U.S. federal government has begun to report the number of cases,² but these data underestimate the magnitude of the pandemic’s impact in the nursing home setting. Twenty-one percent (21%) of 7,424 nursing homes had at least one COVID-19 case in one study published in the *Journal of the American Geriatrics Society (JAGS)*.³ In a second study published in *JAGS*, 35% of 341 nursing homes from a large chain and 21% of 3,016 facilities in 12 of the same states had at least one positive viral test. The median prevalence of viral positivity was 19.5% in 64 of this chain’s nursing homes that underwent universal testing.⁴ The Centers for Medicare & Medicaid Services (CMS) reported 142,231 confirmed and 90,600 suspected COVID-19 cases and 38,518 COVID-19 deaths as of July 12, 2020,² suggesting that only slightly over 10% of nursing home population has had either confirmed or suspected COVID-19. Among 26 states reporting data through the second week in May, 50% of COVID-19–related deaths occurred in long-term care facilities.⁵ An average of 44% to 45% of COVID-19–related deaths nationwide occur in people cared for in nursing homes and assisted living facilities (ALFs), with substantial variability between the 26 states reporting data through the second week of May.^{6,7} Although older people living in ALFs have not been a primary focus of federal efforts to date,⁸⁻¹⁰ the Centers for Disease Control and Prevention (CDC) has issued basic guidance for this setting,¹¹ and a report prepared for Congress involving 11 of the largest ALF operators suggests that the infection rate among ALF residents is five times the national rate. Twenty-four percent (24%) of facilities had at least one virus-positive resident, and 8% had outbreaks of at least 10 cases. Among the viral-positive residents, 43% were hospitalized and 31% died.¹²

The national data on viral infection, COVID-19, and mortality in nursing homes are likely substantial underestimates for several reasons. Nursing homes were not required to report testing results or COVID-19 disease until recently, and an ongoing lack of viral testing capability has plagued most facilities, limiting the number diagnosed.¹³ Many currently available viral tests have a relatively high false-negative rate,¹⁴⁻¹⁶ and nasal swab tests may be especially difficult to perform in the cognitively impaired population, so that even if tests were available, they may have underestimated the true

From the *Department of Integrated Medical Sciences, Charles E. Schmidt College of Medicine, Florida Atlantic University, Boca Raton, Florida; and the †Department of Health Care Policy, Harvard Medical School, Boston, Massachusetts.

Address correspondence to Joseph G. Ouslander, MD, Charles E. Schmidt College of Medicine, Florida Atlantic University, 777 Glades Rd, Boca Raton, FL 33431. E-mail: jousland@health.fau.edu

DOI: 10.1111/jgs.16784

prevalence. In addition, symptoms of COVID-19 are not typical in the nursing home population; even those with typical symptoms may not test positive for the virus and have another respiratory or cardiovascular cause of their symptoms.¹⁷ Nonspecific symptoms may result in a substantial number of undiagnosed cases.

The situation in nursing homes is a “perfect storm.” The storm includes multiple ingredients. The nursing home population is composed of “patients” admitted from hospitals and long-term care “residents” (in this article, we use the term “residents” for simplicity). With an average age in the 80s, most have multiple comorbidities and/or an immunocompromised state that predispose them to acquiring SARS-CoV-2, atypical presentations of COVID-19, and the adverse consequences and mortality from the illness. Although admissions from hospitals to nursing homes have decreased substantially due to the hold on elective surgeries and other factors, transfers from hospitals have now begun to increase as more hospitals are performing these surgeries. Vulnerable older people discharged from hospitals could carry the virus into the nursing home during the care transition. Some nursing home residents have end-stage renal disease and go in and out of the facility two to three times per week for dialysis. These individuals may be at especially high risk for acquiring and transmitting the virus.¹⁸

Nursing homes are a congregate living setting, and despite social distancing measures, including no group dining or activities, most nursing homes have a majority of rooms with more than one occupant and shared bathrooms, facilitating transmission of the virus. Care includes “high-touch” activities, like bathing, dressing, and toileting, that do not allow for social distancing. Many residents with dementia and other forms of cognitive impairment will not be able to tolerate wearing a mask or cooperate with social distancing. Staff and clinicians who come in and out of the building, many of whom work in multiple facilities,¹⁹ can be presymptomatic or asymptotically shedding the virus while passing screening questionnaires and temperature recordings.

The virus is blind to the quality of the nursing home. Even the best quality nursing homes can have a substantial number of COVID-19 cases and deaths. Two studies, cited above, demonstrate no relationship between Five Star quality measures and having viral-positive residents in the facility.^{3,4} The prevalence of the virus in the surrounding community was the major factor driving viral infection in these facilities. In a study published in *JAGS* involving Connecticut nursing homes, the acquisition of the virus was not associated with quality ratings.²⁰ However, among facilities with at least one case, the average number of cases was lower in facilities with higher quality ratings and higher nursing staffing. This study suggests that better quality facilities with higher levels of nursing staffing are better prepared to contain the spread of the virus once it is in the facility.

Nursing homes have struggled while facing this perfect storm blindfolded with their hands tied behind their back. Blindfolded in the sense that many nursing homes have had a lack of testing capability that has not allowed them to identify viral-positive residents and staff. Their hands tied behind their back in the sense that there has also been widely reported challenges in obtaining adequate personal

protective equipment (PPE) throughout the industry.¹³ Moreover, federal, state, and county guidance and regulations have contradicted each other, and who will pay for ongoing staff testing and PPE, where available, is still not clear.

THE STORM'S EFFECTS ON NURSING HOME RESIDENTS AND FAMILIES, STAFF, AND THE INDUSTRY

The pandemic has had devastating effects for many nursing home residents and their families, as well as for nursing home staff and clinicians.^{21,22} Some nursing homes have suffered through the rapid spread of the virus, multiple COVID-19 cases, and related deaths like a wildfire throughout the facility. An article published in *JAGS* online illustrates this graphically and dramatically, describing a Connecticut nursing home that had limited testing capability when the pandemic first started.²³ On a March 19, 2020, “heat map,” the facility had 12 residents on one wing with symptoms possibly related to the virus; they had access to six viral tests and found one positive in the wing. On an April 17, 2020, heat map, less than a month later, the virus had spread to two wings, with 47 symptomatic residents, 11 positive viral tests (there was still a limited supply of tests), and 30 suspected COVID-19–related deaths. A close colleague describes a good quality nursing home in which 71 of the 95 residents developed COVID-19, 16 died, and 45 staff tested positive for the virus. This facility has experience obtaining “do not hospitalize orders” and providing comfort care, but the situation became so stressful on one Sunday that 911 was called five times to transfer residents who were decompensating (personal communication). These are only two of dozens, or perhaps hundreds of similar stories that vividly portray the human toll of this pandemic in the nursing home population and the health professionals who work in this setting.

Infection control measures required to prevent the virus from entering nursing homes and spreading within them have resulted in logistical challenges for facilities with mostly double rooms and other space constraints. For many facilities, it is not possible to isolate and/or create quarantine areas for residents with symptoms suggestive of COVID-19, as well as those admitted from the hospital, and those known to have positive viral tests.

Isolation can have many negative effects on mood, cognition, function, and quality of life in nursing home residents, as well as among staff. It can also be anxiety provoking and emotionally traumatic for families and others who cannot visit their loved ones.^{21,22} Most of us have heard of tragic situations in which families have had to say goodbye and witness the death of their parent, grandparent, or other close relative virtually, instead of being there in person.

Although the emerging data cited above suggest that the quality of nursing homes is not the major factor associated with the acquisition of the virus, and that even the highest quality nursing homes can have devastating clusters of infection, serious illness, and death, the public image of nursing homes is suffering. At the same time, CMS is intensifying the survey process and increasing fines for violations of infection prevention and control recommendations²⁴—even when

many nursing homes cannot obtain adequate testing or PPE to implement the recommendations.

COVID-19 has been devastating for the nursing home workforce. Nursing homes report that over 500 staff members have died from COVID-19 nationally. Certified nurse aides receive close to minimum wage, and many lack paid sick leave, health insurance, and other benefits. Staff and clinicians who work in nursing homes risk their own and their family's health and lives every day to care for the most vulnerable U.S. citizens under the most stressful and underresourced circumstances one could imagine. They deserve our appreciation and thanks, not sensational headlines. That said, facilities that violate federal, state, and local standards of care should be accountable for their failures to adequately protect and care for their resident population.

The storm also has the potential to devastate the financial viability of many nursing homes. They are facing the high costs of implementing intensive infection prevention and control, including isolation and the creation of quarantine areas, viral testing for staff, PPE, as well as other emergency preparedness strategies at a time when admissions and census have declined substantially.²⁵ Although some federal, state, and local support has been provided (including Medicare and Medicaid coverage of viral testing for residents and some states support regular testing of staff), much more will be needed to help support the costs of repeated staff testing and maintaining adequate PPE over the coming months. The finances will be especially challenging in the face of reduced short-stay Medicare-related admissions, and a high number of deaths among long-stay residents on Medicaid. These circumstances have the potential for a devastating impact on the industry as a whole.

THE STORM WILL CONTINUE

Anyone who listens to public health officials and experts, follows local, state, national, and international data, or witnesses the large crowds at beaches, bars, and other gatherings, during which participants do not maintain social distancing or wear masks to protect others or themselves, understands that the storm will not go away easily or in the near future. The balance between protecting the public's health and "reopening" the country to relieve the psychological stresses of isolation and facilitate economic recovery is delicate and tricky. Despite the efforts of federal, state, and local governments to develop phased plans for reopening,²⁶ viral infection, COVID-19 disease, and related complications and deaths are likely to continue for many months or longer.

As our country reopens, the number of positive viral tests is increasing in many states, especially among younger people. Although those younger than 60 years who become infected are at relatively low risk for COVID-19 disease and related complications, they do have the potential to spread the virus to older relatives, coworkers, or, in the case of healthcare workers, to the patients and nursing home residents they care for. In a study of COVID-19 in Canadian long-term care facilities, mortality among residents was associated with viral infection among staff with a 6-day lag period.²⁷ This study highlights the fact that asymptomatic staff, including clinicians and contractors

who come in and out of the facility, are likely to be the source of infection that could perpetuate outbreaks in nursing homes for many months to come. In addition, federal guidance now allows states to open nursing homes to visitors.²⁶ Although mitigating the psychological effects of the pandemic and isolation on nursing home residents and their families is a high priority, adding visitors to the staff, clinicians, and contractors who regularly go in and out of nursing homes will further increase the risk of bringing the virus into the facility unless done carefully.

The ingredients of this ongoing perfect storm make nursing homes a tinderbox for igniting additional tragic clusters of infection. A single presymptomatic or asymptomatic person who is unknowingly infected and shedding virus, whether it be staff member, a clinician, a contractor, or a visitor, could start the fire. Nursing homes must therefore not let their guard down, and further intensify efforts to prevent viral infections and to reduce the spread when infection does occur. Recent reports suggest that the tinderbox has already been ignited in many nursing homes in states with a high prevalence of the virus, such as Florida and Texas.^{28,29} Texas, for example, has reported a 60% increase in COVID-19 cases in nursing homes since the beginning of July.²⁹

At the same time the number of COVID-19 cases is increasing, no effective treatments are currently available to manage this disease in the nursing home setting.^{14,30,31} Convalescent plasma has shown some promise,³² and numerous vaccine trials are underway, but large numbers of nursing home residents are unlikely to be included in these trials, which will pose a challenge for evidence-based therapy in the nursing home in the near future. Because COVID-19 appears to be associated with thrombotic events,³³ many nursing home clinicians are initiating anticoagulation for residents with COVID-19. However, a multi-nursing home study performed in Europe and published in *JAGS* showed no difference in mortality between nursing home residents with COVID-19 who did versus did not receive anticoagulation.³⁴ The predisposition to thrombotic events may result from a combination of the effects of the virus and the immobility associated with COVID-19, and anticoagulation may be reasonable to consider for some residents. However, among residents with life-limiting illnesses, a person-centered approach assessing the risks and benefits of this approach in individual residents is essential.

APPROACHES TO CALMING THE STORM

There are many public health, policy, resource, and clinical approaches to calming the perfect storm in the nursing home setting (Table 1). The rapidly evolving nature of the pandemic makes it hard to keep up with all of the latest information. Several websites provide comprehensive resources related to SARS-CoV-2 and COVID-19 in nursing homes, including the American Health Care Association,³⁵ the John A. Hartford Foundation,³⁶ the Society for Post-Acute and Long-Term Care Medicine/AMDA,³⁷ and the American Geriatrics Society.³⁸ In addition, CDC and CMS guidance provides detailed recommendations on infection control and prevention in the nursing home setting.^{39,40}

Table 1. Approaches to Calming the Perfect Storm of COVID-19 in NHs

Approach	Examples
Public health	<ul style="list-style-type: none"> • Maintenance of intensive infection prevention and control education and procedures and refinement of emergency preparedness plans • Ongoing screening of all individuals who enter the facility • Isolate or quarantine all admissions from the hospital regardless of test results^a • Regular viral testing of staff, clinicians, contractors, and residents (see Table 2) • Slow and careful reopening of NHs to visitors
Health policy	<ul style="list-style-type: none"> • Align federal, state, county, and local guidance, rules, and regulations • Ensure that rules and regulations address the diversity of the NH population and the disparities in acquiring the virus, COVID-19, and mortality • Regular updating of CMS waivers and rules to improve the quality, efficiency, and transparency of NH care • Continue to reimburse clinicians for telemedicine virtual visits • Make the survey process more consistent and do not unnecessarily penalize NHs for issues out of their control • Protection of NHs from legal liability in the absence of repeated violations or negligent care
Resources	<ul style="list-style-type: none"> • Focus resources on NHs in underserved areas, where health disparities make residents more susceptible to the virus, COVID-19, and mortality • Ensure adequate support for and availability of rapid, accurate, and regular viral testing (see Table 2) • Ensure support for and availability of adequate PPE • Create backup staffing plans to replace staff who test positive for the virus and consider utilizing staff who have positive serologic testing for units that have viral-positive or suspected cases • Strengthen communication, collaboration, and resource sharing between NHs, local hospitals, and health systems • Further develop units for viral-positive residents and those requiring quarantine after hospitalization in wings of existing facilities, dedicated NHs, or utilizing existing locations in the community
Clinical care	<ul style="list-style-type: none"> • Redouble efforts to reduce unnecessary transfers to the emergency department, hospitalizations, and hospital readmissions using existing strategies, programs, and tools • Have a high index of suspicion and low threshold for isolation of residents with almost any acute change in condition because of the nonspecific and atypical presentation of COVID-19 in the NH population • Provide a combination of virtual and in-person visits, depending on the clinical needs of the residents • Aggressively attempt to reduce polypharmacy and inappropriate medications, especially in residents with life-limiting illness, using evidence-based and expert-recommended guidance to reduce adverse events, staff time in medication administration, monitoring, and documentation, and minimize interactions during which the virus can be transmitted • Further enhance advance care planning and obtaining and documenting care-limiting orders in appropriate residents using available tools that go beyond just “do not resuscitate” (i.e., “do not intubate” and “do not hospitalize unless necessary for comfort”) and insure adequate comfort care medication in the NH to manage rapid respiratory decompensation in residents who do not want to be hospitalized • Use technology (e.g., virtual visits and programs) to mitigate the effects of loneliness and isolation from families and loved ones

Abbreviations: CMS, Centers for Medicare & Medicaid Services; NH, nursing home; PPE, personal protective equipment.

^aUpdated Centers for Disease Control and Prevention guidance now differs for transfer of patients with known COVID-19 and those with one negative test or unknown testing status.⁴¹

Public Health

From a public health standpoint, nursing homes must maintain intensive infection prevention and control education and procedures with continuing ongoing screening of all individuals who enter the facility. CDC guidance on testing and isolation of patients discharged from the hospital has recently changed.⁴¹ Viral testing is no longer required for patients with known viral infection and COVID-19. For COVID-19 patients with mild to moderate illness and who are not immunocompromised, at least 10 days must have passed since symptoms first appeared, and at least 24 hours must have passed since last fever without the use of fever-reducing medications, and symptoms (e.g., cough and shortness of breath) have improved before removing the patient from isolation. For patients with severe COVID-19 symptoms and/or an immunocompromised state, 20 days must have passed since symptoms first appeared. The

following data form the basis for these new recommendations. First, the likelihood of recovering replication-competent virus declines after onset of symptoms. Second, replication-competent virus has not been recovered from patients with mild to moderate COVID-19 after 10 days following symptom onset, or after 20 days for those with severe symptoms and/or who are immunocompromised. Third, patients can continue to have SARS-CoV-2 RNA detected in their upper respiratory specimens for up to 12 weeks, but they do not have detectable replication-competent virus. The new CDC guidance suggests that for patients with one negative test, and patients with no symptoms and unknown status who meet the nontesting criteria outlined above, do not need to be isolated. However, it is still prudent to consider requiring isolation until two negative tests 24 hours apart within 48 hours of hospital discharge (or one negative test in the hospital and an additional negative test in the facility) and a period of at

least 3 days with no symptoms and no fever (in the absence of antipyretics) for hospital patients transferred to nursing homes. This isolation period adds another measure of protection, because a hospitalized patient could acquire the virus between the time of testing in the hospital and transfer, and there is a possibility that only one negative test can be a false negative. Nursing home residents who have not been viral positive who go to the emergency department (ED) and return without hospital admission, as well as those who go in and out of the facility for dialysis,¹⁸ should be isolated as well because of potential acquisition of the virus.

In addition to intensive infection control procedures, regular viral testing of staff, clinicians, and contractors who come in and out of the facility is essential to calming the storm. As discussed above, these individuals will be the major source of new viral infections in nursing homes, assuming that there is strict adherence to procedures for new admissions as well as after ED and dialysis visits. Issues around testing are complicated and evolving, and there is no consensus on many testing recommendations. Table 2 summarizes some of the key issues and recommendations related to viral and serologic testing.

Multiple studies suggest that point prevalence surveys in nursing homes can identify asymptomatic COVID-19 cases, inform infection control practices, the need for isolation, and guide prioritization of local health department resources.⁴²⁻⁴⁵ Unidentified cases are more commonly found in facilities that already have at least one known positive test.⁴⁵ Experienced nursing home clinicians and medical administrators advocate for frequent testing of staff.⁴⁶ The American Health Care Association has published a detailed algorithm related to testing in the nursing home setting.³⁵ CDC guidance now recommends viral testing of staff weekly, but individual states, counties, health systems, and nursing home organizations are taking varying approaches. Some states are providing support for testing staff every 1 to 2 weeks. In addition, the federal government is now providing equipment and support for equipment and weekly rapid antigen tests that can be performed in nursing homes that have completed a modified Clinical Laboratory Improvement Amendments certification process and go through online training.^{47,48} This rapid point-of-care test is an antigen test with a sensitivity that may be as low as 80%, but with a specificity of 100%. Thus, if it is positive you can be certain the individual is infected. However, additional testing is necessary to have a high degree of certainty that staff with a negative antigen test are truly virus free.

Testing of staff with a high-sensitivity, noninvasive method as often as twice per week would be the safest approach, because staff could acquire the virus within hours of leaving the facility and shed the virus asymptotically within 24 to 48 hours when back at work. Thus, to prevent one individual from igniting the tinderbox, this frequency of testing may be necessary. However, frequent testing will be challenging given an ongoing lack of highly accurate rapid tests and related supplies, the cost of the tests and the staff time to administer the tests and track and follow up on the results, and the discomforts of repeated testing (especially when nasal and nasopharyngeal tests are used), potentially prompting many staff to refuse. Less onerous testing, such as saliva and oral swabs, may make

frequent viral testing more acceptable and feasible for frequent testing. The role of serologic testing is controversial, because it is unknown if antibodies detected are protective, and if so for how long.^{49,50} Some scientists argue that during this pandemic, we cannot await definitive findings and we have to presume that otherwise healthy people who tested positive will have some degree of immunity.⁵⁰ Thus, it may be reasonable to request staff who test positive for antibodies to serve in COVID-19 units, with the understanding that it is not 100% certain that they are immune.

Federal regulations now enable nursing homes to allow visitors in the facility.²⁶ These regulations are critical to mitigating the psychological effects of isolation noted above, but visitation policies must ensure the safety of all involved, especially in areas with a high community prevalence of the virus, because of the potential for viral transmission during these visits. Several states are proceeding with outdoor visits, with social distancing and masks, which is a balanced and reasonable approach—guidance from the state of Colorado is one example.⁵¹

Health Policy

Alignment and consistent messaging of key federal, state, county, and local guidance, rules, and regulations will be helpful, recognizing that some flexibility is necessary because of the size and heterogeneity of our country and the local factors that may play a role in the most effective and efficient care. Rules and regulations should address the diversity of the nursing home population and workforce, as data suggest that there are disparities between people of different races as well as between females and males in relation to acquiring the virus, experiencing COVID-19 disease, and mortality.^{3,4,52-54}

CMS has put into place many waivers and rules that address important concerns of the nursing home industry, residents and families, and health professionals, ranging from waiving physical environment requirements and the 3-day hospital stay, to waiving training and certification requirements for newly hired nursing aide staff, to allowing delegation of required physician visits to advance practice clinicians.⁵⁵ Reimbursement for telehealth visits has changed the way many clinicians are practicing, and can improve not only routine visits, but be helpful for evaluating acute changes in condition with high-quality equipment and trained telepresenters and preventing unnecessary hospital transfers that are associated with lack of on-site clinicians. Ongoing updates of these CMS waivers and rules to improve the quality, efficiency, and transparency of nursing home care will be an important component of calming the storm.

CMS has also focused the survey process on infection control,²⁴ which should be helpful if it is consistent across the United States and does not penalize unduly poor resourced facilities that have lacked PPE and testing. In addition, nursing homes should have reasonable protection from legal liability for simply having COVID-19 cases and mortality, as it is clear that even high-quality nursing homes with sound infection control practices can have these occurrences.^{3-5,20}

In addition to federal policies, several major organizations have issued policy briefs and position statements and offered recommendations on health policy strategies that

Table 2. Key Issues Related to Testing for SARS-CoV-2 in Nursing Homes**General**

- The federal government has delegated testing to the states, which are taking varying approaches
- The availability of testing and how it is paid for is highly variable, costly, and evolving
 - Medicare and Medicaid now support testing of residents
 - Some states are mandating and supporting every 2 wk or more often testing of staff and clinicians
 - The federal government is providing equipment and a limited number of rapid point-of-care viral tests to nursing homes in communities with a high prevalence of the virus
 - These facilities must go through modified CLIA certification and online training, and test staff weekly
- Testing should not replace intensive infection prevention and control education and interventions
 - Guidance from the CDC and CMS is available and should be used when developing strategies^a
- Optimally, viral tests approved by the Food and Drug Administration with a minimum sensitivity of 95% and specificity of 90% should be used
 - Some tests have false-negative rates as high as 30%
 - Nasopharyngeal swab tests are currently the most sensitive test
- Nasal swab testing, especially nasopharyngeal testing, can be uncomfortable and difficult to perform, especially in residents with dementia, and is probably too uncomfortable to administer to staff on a regular basis
 - Tests based on oropharyngeal swabs and saliva are becoming available and are not as uncomfortable as nasal and nasopharyngeal swab testing, and may be more feasible for regular testing
- Viral testing of staff is likely to identify asymptomatic viral-positive individuals, which will result in the need for:
 - A backup plan to provide adequate staffing while test-positive staff are in quarantine
 - A sound communication plan for residents, families, and the community
- If access to viral testing is limited, priorities for testing should include facilities that:
 - Have a known infection in one or more residents or staff
 - Are located in communities with a higher prevalence of viral-positive tests and/or COVID-19 disease
- The timing of viral testing is critical:
 - One-time testing only provides a snapshot of a single point in time
 - Once an individual is infected, symptoms take several days to develop
 - Asymptomatic viral shedding can start in as few as 1–3 d; thus, frequent testing (weekly or even more often) is necessary to identify all new active infections in asymptomatic staff and clinicians
- Antibody testing is not helpful to diagnose active infection, and the use of antibody testing to inform infection control strategies and staffing is controversial. It can be considered, with understanding of several caveats:
 - The level of antibodies that are protective against COVID-19 is not known
 - The duration of immunity to COVID-19 from antibodies presumed to be protective is not known
 - Antibodies do not start developing until 6–7 d after infection; thus, the timing of the test is important
 - Older residents with comorbidity and/or who are immunocompromised may not have a robust antibody response to viral infection

Strategies for testing residents, staff, and clinicians^b

- Where accurate tests are available, universal viral testing can be helpful in establishing a baseline of how many residents and staff have the virus, and for developing a staffing and isolation/quarantine plan
- Requirements for testing of residents, staff, and clinicians vary state by state
 - Some states and nursing homes are now requiring that residents, staff, and clinicians who refuse testing are considered viral positive and be placed in quarantine for 14 d
- Frequent viral testing (once a week per CDC recommendation) may not be feasible for many facilities due to test availability, will result in more isolation and PPE use, and is expensive—but is essential to prevent further outbreaks^c

For residents

- New admissions from the hospital should optimally have two negative viral tests at least 24 h apart with the latest no longer than 48 h before hospital discharge; and no fever (without acetaminophen) and no symptoms for at least 3 d^d
 - Regardless of testing status, all new admissions from the hospital should be isolated for 10–14 d, as the virus can be acquired between the time of testing and hospital discharge, and tests can be falsely negative^d
- Residents already in the facility should be monitored at least every shift for a change in condition
 - Almost any acute change should prompt immediate isolation and viral testing (including an asymptomatic roommate if there is one) because the symptoms of COVID-19 can be nonspecific or atypical
 - Residents going in and out of the facility for dialysis are at especially high risk, and should be monitored carefully for new symptoms and considered high priority for viral testing

For staff and clinicians

- Where accurate testing is available, staff and clinicians not known to have been previously viral positive should undergo viral testing at least weekly, and if possible twice per week given the rapid shedding of virus after it is acquired
 - This is especially important as states initiate plans to open more businesses, schools, etc, which will potentially expose staff and clinicians more frequently to the virus
 - Staff and clinicians who work in multiple health care facilities should be a high priority for repeated testing
 - A backup plan to maintain adequate staffing levels is essential as some staff will test positive and need a 10–14 d period of quarantine

Note: The American Health Care Association and National Center for Assisted Living have developed an algorithm and recommendations with relevant links that provide detailed recommendations for testing under various circumstances.³⁵

Abbreviations: CDC, Centers for Disease Control and Prevention; CLIA, Clinical Laboratory Improvement Amendments; CMS, Centers for Medicare & Medicaid Services; PPE, personal protective equipment; SARS-CoV-2, severe acute respiratory syndrome coronavirus-2.

^aThe CDC and the CMS websites provide relevant guidance from the federal government.^{2,4,26,40,41,68}

^b“Staff” includes all of the nursing, other professional staff, and contractors and vendors who are regularly on-site; “clinicians” includes physicians, nurse practitioners, physician assistants, psychologists, and other health professionals who see patients/residents in the facility.

^cViral tests can be falsely negative and infection can occur between tests, and shedding can occur as early as 24 to 48 hours after infection, so that even weekly testing where available has limitations.

^dUpdated CDC guidance now differs for transfer of patients with known COVID-19 and those with one negative test or unknown testing status.⁴¹ However, the nontesting strategy for patients with no history of COVID-19 and unknown status could result in transmission of the virus into the facility (see text).

should be helpful to nursing home efforts in their efforts to manage through this crisis.^{7,9,35,37,56-59}

Resources

We will not calm the perfect storm unless those most vulnerable to infection and related adverse events have adequate protection. Nursing homes should therefore be a priority for federal and state governments in providing adequate testing capability and PPE, especially nursing homes in underserved areas, where health disparities make residents more susceptible to the virus, COVID-19, and mortality. The federal government has now allocated over \$15 billion to assist nursing homes in managing the pandemic, but industry experts suggest that much more is necessary to help support ongoing testing, PPE, and staffing shortages.

As more testing capability and the requirements for testing increase, nursing homes must create backup staffing plans to replace staff who test positive for the virus and consider utilizing staff who have positive serologic testing for units that have viral-positive or suspected cases. Strengthening communication, collaboration, and resource sharing between nursing homes, hospitals, and health systems is another approach to making more resources available to calm the storm in the nursing home setting. There are examples of this type of collaboration in the United States as well as other countries.⁶⁰⁻⁶⁴

Further development of units for viral-positive residents and those who require quarantine after hospitalization in wings of existing facilities, dedicated facilities, or repurposing existing locations in the community is essential.⁶⁵⁻⁶⁸ Without this capacity, we may not be able to manage additional waves of COVID-19 that may occur (and are already occurring in some states), as well as for the surge in other respiratory illnesses that will add to the need during the upcoming fall and winter. Many organizations have developed geographically separate COVID-19 units within facilities with separate entrances and exits and dedicated staff. These units can accept newly admitted patients from the hospital who require a period of 10 to 14 days of isolation or quarantine, as well as have a separate section for residents known to be viral positive. Such units are not feasible in many facilities, and some states are designating entire facilities in certain areas to serve this purpose. Other approaches, such as repurposing large spaces for temporary use, as was done early during the pandemic, may be necessary in some areas.^{67,68}

Clinical Care

The pandemic affords us opportunities to improve the clinical care provided in nursing homes. First, we should redouble efforts to reduce unnecessary ED transfers, hospitalizations, and hospital readmissions using existing strategies, programs, and tools.^{69,70} Not only will this prevent complications from hospital-acquired conditions and reduce overall health expenditures, it will reduce the need to isolate residents when they return from the hospital for 10 to 14 days, repeated viral testing, and use of PPE. Nursing home residents should have vital signs taken at least every 8 hours to monitor for changes in condition. Nursing home staff and clinicians must have a high index of suspicion and

low threshold for isolation of residents with almost any acute change in condition, because of the nonspecific and atypical presentation of COVID-19 in this population.¹⁷ Clinicians should provide a combination of virtual and in-person visits, depending on the residents' clinical needs. Although it is appropriate to take advantage of Medicare reimbursement for telehealth visits, as well as remote monitoring technology that is increasingly available, there is no substitute for in-person visits when making difficult determinations about further evaluation and the potential need for hospital transfer.

An important opportunity during the pandemic is to implement strategies to reduce polypharmacy and inappropriate medications, especially in residents with life-limiting illnesses using evidence-based and expert-recommended guidance.⁷¹⁻⁷³ Reducing polypharmacy will not only reduce adverse events, it will also reduce staff time in medication administration, monitoring and documentation, and minimize interactions during which the virus transmission can occur.

Another opportunity is to further improve advance care planning by obtaining and documenting care-limiting orders in appropriate residents using available tools that go beyond just "do not resuscitate" (i.e. "do not intubate" and "do not hospitalize unless necessary for comfort"). Several tools are available for this purpose.⁷⁴⁻⁷⁷ Care-limiting orders can be specific for the period of the pandemic to avoid transfer of residents who rapidly deteriorate into respiratory failure due to COVID-19 in whom care in an intensive care unit would be unnecessarily burdensome and most likely futile. Palliative care specialists should be involved where available to assist with challenging discussions.⁷⁸ Nursing homes that pursue these care-limiting orders must insure that adequate comfort care medication is available in the nursing home to manage rapid respiratory decompensation in residents who do not want to receive hospital care.

Finally, technology helps mitigate the effects of loneliness and isolation from families and loved ones. In addition to using various videoconference applications, it is possible to deliver some evidence-based interventions, such as games and music virtually.⁷⁹

LEARNING FROM THE CRISIS AND RESHAPING THE FUTURE

The COVID-19 pandemic has highlighted the lack of resources many nursing homes have to handle a crisis of this magnitude. Ideally, this crisis will lead us to reshape how we pay for services, how we regulate nursing homes, and how we can ensure that the industry is better prepared to withstand the next crisis.

The model of paying huge margins for Medicare short-stay residents while underpaying for long-stay Medicaid residents is broken. This was true before COVID-19 but became magnified once hospitals reduced elective procedures and there were no lucrative short-stay residents. It is time to align better payments and costs across Medicare and Medicaid residents. Ideas include federalizing payment of long-stay residents and ensuring that payments for short-stay residents more closely mirror costs.

We need more staff in nursing homes, and we need to pay them better. Minimum staffing standards are one direct way that nursing homes have better staffing. We also need

to ensure that more of the public dollars paid to nursing homes support the staff providing the services. Many nursing home staff are making close to minimum wage, and nursing homes around the country were experiencing staff shortages even before COVID-19.⁸⁰ We also need to make certain that increases in payments go to direct caregivers through approaches like wage floors or wage pass through programs. Moreover, staff need to have full benefits like health insurance and nonpunitive sick leave.

A related problem is that many nursing homes lack clinicians who are on-site, especially for long-stay nursing home residents. Several models have begun to emerge that provide clinical services on-site, such as Medicare Advantage Institutional Special Needs Plans and nursing home-led accountable care organizations.⁸¹ Unlike other value-based payment models that are largely focused on cutting short-stay nursing home care, these models actually increase dollars for clinicians and help bridge the disconnect between long-term care and clinical services.^{82,83}

Nursing homes need our help with payment moving forward, but we also need to hold them accountable in being good stewards of those public payments. Certain nursing homes have not put resources into direct care. The use of medical loss ratio requirements is one approach to ensure a floor in terms of direct care spending. Some nursing homes have also had egregious cases of neglect and abuse of residents, and we must ensure that these “bad apples” are held accountable for these actions. Data regarding care quality need to be transparent to regulators, families, and potential residents.

Finally, several other investments that policy makers can make will help ensure that we are better prepared to withstand the next “perfect storm” of this type. In this article, we have largely focused on nursing homes, but strong investment in home- and community-based services will lessen the number of individuals relying on nursing homes for their care. We also could invest in smaller, more person-centered models of care, like the Green House model.⁸⁴ Strategies that will help nursing homes of all sizes improve infection control and prevention, including intensive education and the requirement of a full-time infection prevention specialist, will help prevent the devastation we have seen in some facilities from COVID-19 from happening in the future.

The saddest part of this perfect storm is that many years of inaction on the part of policy makers contributed to its impact. It did not have to be this way. We now have an opportunity to improve nursing homes to protect residents and their caregivers ahead of the next storm. It is time to reimagine how we pay for and regulate care to achieve this goal.

ACKNOWLEDGMENTS

Conflict of Interest: Dr Ouslander is a full-time employee of Florida Atlantic University (FAU) and has received support through FAU for research on INTERACT from the National Institutes of Health, the Centers for Medicare & Medicaid Services, The Commonwealth Fund, the Retirement Research Foundation, the Florida Medical Malpractice Joint Underwriting Association, PointClickCare, Medline Industries, and Think Research. Dr Ouslander and his wife had ownership interest in INTERACT Training,

Education, and Management (“I TEAM”) Strategies, LLC, which had a license agreement with FAU for use of INTERACT materials and trademark for training during the time of the study, and now receive royalties from Pathway Health, which currently holds the license. Dr Ouslander serves as a paid advisor to Pathway Health, Think Research, Curavi, and NaviHealth. He also serves on the Centers for Medicare and Medicaid Nursing Home 5-Star Technical Expert Panel. Work on funded INTERACT research is subject to the terms of Conflict of Interest Management plans developed and approved by the FAU Financial Conflict of Interest Committee.

Dr Grabowski serves on the Centers for Medicare and Medicaid Nursing Home 5-Star Technical Expert Panel, the Medicare Payment Advisory Commission, and the President’s Coronavirus Commission on Safety and Quality in Nursing Homes. He also serves as a paid consultant to CareLinx and on the advisory board of NaviHealth.

Author Contributions: Both authors contributed to the conceptualization, writing, and editing of this article.

Sponsor’s Role: This article was not supported by external funding.

REFERENCES

1. Grabowski DC, Mor V. Nursing home care in crisis in the wake of COVID-19. *JAMA*. 2020;324(1):23-24. <https://doi.org/10.1001/jama.2020.8524>. Online ahead of print.
2. Centers for Medicare & Medicaid Services. COVID-19 data. <https://data.cms.gov/stories/s/COVID-19-Nursing-Home-Data/bkwz-xpvg>. Accessed July 12, 2020.
3. Abrams HR, Loomer L, Gandi A, Grabowski DC. Characteristics of U.S. nursing homes with COVID-19 cases. *J Am Geriatr Soc*. 2020;68(8):1653-1656.
4. White EM, Kosar CM, Feifer RA, et al. Variation in SARS-CoV-2 prevalence in US skilled nursing facilities. *J Am Geriatr Soc*. 2020. <https://doi.org/10.1111/jgs.16752>
5. Lau-Ng R, Causro LB, Perls TT. COVID-19 deaths in long term care facilities: a critical piece of the pandemic puzzle. *J Am Geriatr Soc*. 2020. <https://doi.org/10.1111/jgs.16669>
6. The Foundation for Research on Equal Opportunity. Nursing homes & assisted living facilities account for 44% of COVID-19 deaths. https://freopp.org/the-covid-19-nursing-home-crisis-by-the-numbers-3a47433c3f70_ Accessed July 25, 2020.
7. Kaiser Family Foundation. State reports of long-term care facility cases and deaths related to COVID-19. https://www.kff.org/health-costs/issue-brief/state-data-and-policy-actions-to-address-coronavirus/?utm_source=web&utm_medium=trending&utm_campaign=covid-19#long-term-care-cases-deaths. Accessed July 12, 2020.
8. American Geriatrics Society. American Geriatrics Society (AGS) policy brief: COVID-19 and assisted living facilities. *J Am Geriatr Soc*. 2020;68:1131-1135.
9. American Geriatrics Society. AGS position statement: resource allocation strategies and age-related considerations in the COVID-19 era and beyond. *J Am Geriatr Soc*. 2020;68:1136-1142.
10. Colenda CC, Reynolds CF, Applegate WB, et al. COVID-19 pandemic and ageism: a call for humanitarian care. *J Am Med Dir Assoc*. 2020;21(8):1005-1006. <https://doi.org/10.1016/j.jamda.2020.05.054>
11. Centers for Disease Control and Prevention. COVID-19: assisted living facilities. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/assisted-living.html>. Accessed July 25, 2020.
12. Report Prepared for the U.S. Congress. COVID-19 in assisted living facilities. <https://www.warren.senate.gov/imo/media/doc/Assisted%20Living%20Facilities%20Staff%20Report.pdf>. Accessed July 25, 2020.
13. Abassi J. “Abandoned” nursing homes continue to face critical supply and staff shortages as COVID-19 toll has mounted. *JAMA*. 2020;324:123-125.
14. Wiersinga WJ, Rhodes A, Cheng AC, Peacock SJ, Prescott HC. Pathophysiology, transmission, diagnosis, and treatment of coronavirus disease 2019 (COVID-19) a review. *JAMA*. 2020. <https://doi.org/10.1001/jama.2020.12839>

15. Cheng MP, Papenburg J, Desjardins M, et al. Diagnostic testing for severe acute respiratory syndrome-related coronavirus 2: a narrative review. *Ann Intern Med.* 2020;172:726-734.
16. Woloshin S, Patel N, Kesselheim AS. False negative tests for SARS-CoV-2 infection — challenges and implications. *N Engl J Med.* 2020. <https://doi.org/10.1056/NEJMp2015897>
17. van Loon A, Rutten J, van Buul L, Joling K, Smallbrugge M, Hertough C. Nursing home residents with (suspected) COVID-19 factsheet 1: symptoms and course. <https://unovumc.nl/wetenschappelijke-artikelen/>. Accessed June 23, 2020.
18. Bigelow BF, Tang O, Toci GR, et al. Transmission of SARS-CoV-2 involving residents receiving dialysis in a nursing home — Maryland, April 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69(32):1089-1094. <https://doi.org/10.15585/mmwr.mm6932e4>
19. Van Houtven H, DePasquale N, Coe NB. Essential long-term care workers commonly hold second jobs and double- or triple-duty caregiving roles. *J Am Geriatr Soc.* 2020. <https://doi.org/10.1111/jgs.16509>
20. Li Y, Temkin-Greener H, Gao S, Cai X. COVID-19 infections and deaths among Connecticut nursing home residents: facility correlates. *J Am Geriatr Soc.* 2020. <https://doi.org/10.1111/jgs.16689>
21. Galea S, Merchant RM, Lurie N. The mental health consequences of COVID-19 and physical distancing: the need for prevention and early intervention. *JAMA Intern Med.* 2020;180:817-818.
22. Lynn J. Playing the cards we are dealt: Covid-19 and nursing homes. *J Am Geriatr Soc.* 2020. <https://doi.org/10.1111/jgs.16658>
23. Blackman C, Farber S, Feifer RA, Mor V, White EM. An illustration of SARS-CoV-2 dissemination within a skilled nursing facility using heat maps. *J Am Geriatr Soc.* 2020. <https://doi.org/10.1111/jgs.16642>
24. Centers for Medicare & Medicaid Services. COVID-19 survey activities, CARES Act funding, enhanced enforcement for infection control deficiencies, and quality improvement activities in nursing homes. <https://www.cms.gov/files/document/qso-20-31-all.pdf>. Accessed June 28, 2020.
25. Barnett ML, Hu L, Martin T, Grabowski DC. Mortality, admissions, and patient census at SNFs in 3 US cities during the COVID-19 pandemic. *JAMA.* 2020;324:507. <https://doi.org/10.1001/jama.2020.11642>
26. Centers for Medicare & Medicaid Services. Nursing home reopening recommendations for state and local officials. <https://www.cms.gov/medicare-reprovider-enrollment-and-certification/surveycertificationgeninfopolicy-and-memos-states-and-nursing-home-reopening-recommendations-state-and-local-officials>. Accessed June 29, 2020.
27. Fisman DN, Bogoch I, Lapointe-Shaw L, McReady J, Tuite AR. Risk factors associated with mortality among residents with coronavirus disease 2019 (COVID-19) in long-term care facilities in Ontario, Canada. *JAMA Netw Open.* 2020;3(7):e2015957. <https://doi.org/10.1001/jamanetworkopen.2020.15957>
28. Leading Age Florida. COVID-19 situation report 7/20/20. https://www.leadingage.org/sites/default/files/LeadingAge%20Florida%20COVID-19%20Situation%20Report_final.pdf. Accessed July 25, 2020.
29. The Houston Chronicle. Texas nursing home COVID-19 cases jump 60 percent since July 1. <https://www.houstonchronicle.com/news/houston-texas/houston/article/Texas-nursing-homes-see-new-spike-in-COVID-19-15413767.php>. Accessed July 25, 2020.
30. Sanders JM, Monogue ML, Jodlowski TZ, Cutrell JB. Pharmacologic treatments for coronavirus disease 2019 (COVID-19): a review. *JAMA.* 2020;323:1824-1836.
31. Cavalcanti AB, Zampieri FG, Rosa RG, et al. Hydroxychloroquine with or without azithromycin in mild-to-moderate Covid-19. *N Engl J Med.* 2020. <https://doi.org/10.1056/NEJMoa2019014>
32. Casadevall A, Joyner MJ, Pirofski LA. Randomized trial of convalescent plasma for COVID-19—potentially hopeful signals. *JAMA.* 2020;324(5):455-457. <https://doi.org/10.1001/jama.2020.10218>
33. Bilaloglu S, Aphinyanaphongs Y, Jones S, Iturrate E, Hochman J, Berger JS. Thrombosis in hospitalized patients with COVID-19 in a New York City Health System. *JAMA.* 2020. <https://doi.org/10.1001/jama.2020.13372>
34. Brouns SH, Bruggemann, Linkens A. Mortality and the use of anti-thrombotic therapies among nursing home residents with COVID-19. *J Am Geriatr Soc.* 2020. [doi:https://doi.org/10.1111/jgs.16664](https://doi.org/10.1111/jgs.16664)
35. American Health Care Association. Combatting coronavirus: our fight to protect seniors & individuals with disabilities in long term care. https://www.ahcancal.org/facility_operations/disaster_planning/Pages/Coronavirus.aspx. Accessed June 29, 2020.
36. The John A. Hartford Foundation. COVID-19 resources for nursing homes & long-term care. <https://www.johnahartford.org/dissemination-center/view/nursing-home-long-term-care-resources>. Accessed June 29, 2020.
37. The Society for Post-Acute and Long-Term Care Medicine/AMDA. AMDA update on COVID-19. <https://paltc.org/COVID-19>. Accessed June 29, 2020.
38. The American Geriatrics Society. AGS coronavirus disease 2019 (COVID-19) information hub. <https://www.americangeriatrics.org/covid19>. Accessed June 29, 2020.
39. Centers for Disease Control and Prevention. Preparing for COVID-19 in nursing homes. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/long-term-care.html>. Accessed June 30, 2020.
40. Centers for Medicare & Medicaid Services. Toolkit on state actions to mitigate COVID-19 prevalence in nursing homes. <https://www.cms.gov/files/document/covid-toolkit-states-mitigate-covid-19-nursing-homes.pdf>. Accessed July 25, 2020.
41. Centers for Disease Control and Prevention. Discharging COVID-19 patients. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/disposition-hospitalized-patients.html>. Accessed July 25, 2020.
42. Goldberg SA, Pu CT, Thompson RW, Mark E, Grabowski DC. Asymptomatic spread of COVID-19 in 97 patients at a skilled nursing facility. *J Am Med Dir Assoc.* 2020;21:980-982.
43. Bigelow BF, Tang O, Barshick B, et al. Outcomes of universal COVID-19 testing following detection of incident cases in 11 long-term care facilities. *JAMA Int Med.* 2020. <https://doi.org/10.1001/jamainternmed.2020.3738>
44. Sanchez GV, Biedron C, Fink LR, et al. Initial and repeated point prevalence surveys to inform SARS-CoV-2 infection prevention in 26 skilled nursing facilities — Detroit, Michigan, March–May 2020. *MMWR Morb Mortal Wkly Rep.* 2020. <https://doi.org/10.15585/mmwr.mm6927e1>
45. Hatfield KM, Reddy SC, Forsberg K, et al. Facility-wide testing for SARS-CoV-2 in nursing homes — seven U.S. jurisdictions, March–June 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69:1095-1099. <https://doi.org/10.15585/mmwr.mm6932e5>
46. Wasserman M, Ouslander JG, Lam A, et al. Diagnostic testing for SARS-coronavirus-2 in the nursing facility: recommendations of a Delphi panel of long-term care clinicians. *J Nutr Health Aging.* 2020;24:538-543.
47. U.S. Department of Health and Human Services. Trump administration announces initiative for more and faster COVID-19 testing in nursing homes. <https://www.hhs.gov/about/news/2020/07/14/trump-administration-announces-initiative-more-faster-covid-19-testing-nursing-homes.html>. Accessed July 25, 2020.
48. American Health Care Association. Frequently asked questions: COVID-19 testing at skilled nursing facilities/nursing homes. [https://www.ahcancal.org/Documents/FINAL_20NH_20FREQUENTLY_20ASKED_20QUESTIONS%20\(2\).pdf](https://www.ahcancal.org/Documents/FINAL_20NH_20FREQUENTLY_20ASKED_20QUESTIONS%20(2).pdf). Accessed July 25, 2020.
49. Sethuraman N, Jeremiah SS, Ryo A. Interpreting diagnostic tests for SARS-CoV-2. *JAMA.* 2020;323:2249-2251.
50. Weinstein MC, Freedberg KA, Hyle EP, Paltiel AD. Waiting for certainty on Covid-19 antibody tests - at what cost? *N Engl J Med.* 2020. <https://doi.org/10.1056/NEJMp2017739>
51. Colorado Department of Public Health and Environment. Guidance for residential care facilities outdoor visitation. <https://covid19.colorado.gov/outdoor-visitation>. Accessed July 1, 2020.
52. Hooper MW, Napoles AM, Perez-Stable EJ. COVID-19 and racial/ethnic disparities. *JAMA.* 2020;323:2466-2467.
53. Dowling MK, Kelly RL. Policy solutions for reversing the color-blind public health response to COVID-19 in the US. *JAMA.* 2020;324(3):229-230. <https://doi.org/10.1001/jama.2020.10531>
54. Rochon PA, Wu W, Giannakeas V, Stall NM. The missing pieces of the COVID-19 puzzle. *J Am Geriatr Soc.* 2020. <https://doi.org/10.1111/jgs.16646>
55. Levitt AF, Ling SM. COVID-19 in the long-term care setting: the CMS perspective. *J Am Geriatr Soc.* 2020. <https://doi.org/10.1111/jgs.16562>
56. American Geriatrics Society. American Geriatrics Society policy brief: COVID-19 and nursing homes. *J Am Geriatr Soc.* 2020;68:908-911.
57. Laxton CE, Nace DA, Nazir A. Solving the COVID-19 crisis in post-acute and long-term care. *J Am Med Dir Assoc.* 2020;21:885-887.
58. Lester PE, Holahan T, Siskind D, Healy E. Policy recommendations regarding skilled nursing facility management of coronavirus 19 (COVID-19): lessons from New York State. *J Am Med Dir Assoc.* 2020;21:888-892.
59. Preventing and Managing COVID-19 Across Long-Term Care Services: Policy Brief July 24, 2020. Geneva, Switzerland: World Health Organization; 2020 (WHO/2019-nCoV/Policy_Brief/Long-term_Care/2020.1). Accessed July 29, 2020.
60. Unroe KT, Vest J. Time to leverage health system collaborations: supporting nursing facilities through the COVID-19 pandemic. *J Am Geriatr Soc.* 2020;68:1129-1130.
61. Davidson GH, Roxbury AC, Neukirch J, et al. A health system response to COVID-19 in long-term care and post-acute care: a three-phase approach. *J Am Geriatr Soc.* 2020;68:1155-1161.
62. Bakaev I, Retalic T, Chen H. Universal testing-based response to COVID-19 outbreak by a long-term care and post-acute care facility. *J Am Geriatr Soc.* 2020. <https://doi.org/10.1111/jgs.16653>
63. Cofais C, Veillarf D, Farges C, et al. COVID-19 epidemic: regional organization centered on nursing homes. *J Am Geriatr Soc.* 2020. <https://doi.org/10.1111/jgs.16687>
64. Stall NM, Farquharson C, Fan-Lun C, et al. A hospital partnership with a nursing home experiencing a COVID-19 outbreak: description of a

- multiphase emergency response in Toronto, Canada. *J Am Geriatr Soc.* 2020. <https://doi.org/10.1111/jgs.16625>
65. Sohn L, Lysaght M, Schwartzman WA, Simon SR, Goetz MB, Yoshikawa T. Establishment of a COVID-19 recovery unit in a veteran affairs (VA) post-acute facility. *J Am Geriatr Soc.* 2020. <https://doi.org/10.1111/jgs.16690>
66. Grabowski DC, Joynt Maddox KE. Postacute care preparedness for COVID-19: thinking ahead. *JAMA.* 2020;323:2007-2008.
67. Tumlinson A, Altman W, Glaudemans J, Gleckman H, Grabowski DC. Post acute preparedness. *J Am Geriatr Soc.* 2020. <https://doi.org/10.1111/jgs.16519>
68. Centers for Disease Control and Prevention. Transferring patients to relief healthcare facilities. https://www.cdc.gov/coronavirus/2019-ncov/hcp/relief-healthcare-facilities.html?deliveryName=USCDC_425-DM32904. Accessed July 26, 2020.
69. The Society for Post-Acute and Long-Term Care Medicine. <https://paltc.org/resources>. Accessed March 29, 2020.
70. Interventions to reduce acute care transfers. <https://pathway-interact.com>. Accessed March 29, 2020.
71. Brandt N, Steinman MA. Optimizing medication management during the COVID-19 pandemic: an implementation guide for post-acute and long-term care. *J Am Geriatr Soc.* 2020. <https://doi.org/10.1111/jgs.16573>
72. University of Maryland School of Pharmacy. Optimizing medication management during the COVID-19 pandemic: implementation guide for post-acute and long-term care. <https://www.pharmacy.umaryland.edu/PALTC-COVID19-MedOpt>. Accessed July 2, 2020.
73. Ouslander JG. Improving drug therapy for patients with life-limiting illnesses: let's take care of some low hanging fruit. *J Am Geriatr Soc.* 2020;68:682-685.
74. Respecting Choices. <https://respectingchoices.org/covid-19-resources/>. Accessed March 29, 2020.
75. Vital Talk. <https://www.vitaltalk.org/guides/covid-19-communication-skills/>. Accessed March 29, 2020.
76. Center to Advance Palliative Care. CAPC COVID-19 response resources. <https://www.capc.org/toolkits/covid-19-response-resources/>. Accessed March 29, 2020.
77. Gaur S, Pandya N, Dumyati G, et al. A structured tool for communication and care planning in the era of the COVID-19 pandemic. *J Am Med Dir Assoc.* 2020;21(7):943-947. <https://doi.org/10.1016/j.jamda.2020.05.062>
78. Nakagawa S, Berlin A, Widera E, Periyakoil VS, Smith AK, Blinderman CD. Pandemic palliative care consultations spanning state and institutional borders. *J Am Geriatr Soc.* 2020. <https://doi.org/10.1111/jgs.16643>
79. Scales K, Zimmerman S, Miller SJ. Evidence-based non-pharmacological practices to address behavioral and psychological symptoms of dementia. *Gerontologist.* 2018;58(suppl 1):S88-S102.
80. Geng F, Stevenson DG, Grabowski DC. Daily nursing home staffing levels highly variable, often below CMS expectations. *Health Aff (Millwood).* 2019;38:1095-1100.
81. McGarry BE, Grabowski DC. Managed care for long-stay nursing home residents: an evaluation of institutional special needs plans. *Am J Manag Care.* 2019;25:438-443.
82. Burnett ML, Mehrotra A, Grabowski DC. Postacute care: the piggy bank for savings in alternative payment models? *N Engl J Med.* 2019;381:302-303.
83. Jones CD, Nearing KA, Burke RE, et al. "What would it take to transform post-acute care?" 2019 conference proceedings on re-envisioning post-acute care. *J Am Med Dir Assoc.* 2020;21:1012-1014.
84. Afendulis CC, Caudry DJ, O'Malley AJ, Kemper P, Grabowski DC. Green house adoption and nursing home quality. *Health Serv Res.* 2016;51(suppl 1):454-474.