State of the Pandemic Commentary:
Preparing Nursing Homes for a Second Wave of COVID-19

A. Rekha Murthy, MD (Division of Infectious Diseases, Department of Medicine, Cedars-Sinai Medical Center, Los Angeles, CA)

Jennifer A. Hanrahan, DO (Division of Infectious Diseases, University of Toledo College of Medicine and Life Sciences Medical Director, Infection Control and Prevention, ProMedica) ORCID: 0000-0002-7443-5985

Sonali D. Advani, MBBS, MPH (Department of Internal Medicine, Duke University School of Medicine, Durham, NC) ORCID: 0000-0001-5162-6482

Muhammad Salman Ashraf, MBBS (Division of Infectious Diseases, Department of Internal Medicine, University of Nebraska Medical Center, Omaha, NE) ORCID: 0000-0002-0749-1282

John P. Mills, MD (Department of Internal Medicine, Division of Infectious Diseases, University of Michigan Medical School, Ann Arbor, MI) ORCID: 0000-0001-6529-2911

Lona Mody, MD, MSc (University of Michigan Medical School and Veterans’ Affairs Ann Arbor Healthcare System, Ann Arbor, MI)

David K. Henderson, MD (Clinical Center, National Institutes of Health, Bethesda, MD)

Mary K. Hayden, MD (Rush University Medical Center, Chicago, IL)

David J. Weber, MD, MPH (Division of Infectious Diseases, University of North Carolina, Chapel Hill, NC)

Sharon B. Wright, MD, MPH (Beth Israel Deaconess Medical Center, Boston, MA)

Hilary Babcock, MD, MPH (Washington University School of Medicine, and Medical Director for the Infection Prevention and Epidemiology Consortium of BJC HealthCare, St. Louis, MO)

Judith Guzman-Cottrill, DO (Oregon Health and Science University, Portland, OR)

Sarah D. Haessler, MD, MS (UMass Medical School-Baystate, Springfield, MA)

Clare Rock, MD, MS (Johns Hopkins University School of Medicine, Baltimore, MD)

Trevor Van Schooneveld, MD (University of Nebraska Medical Center, Omaha, NE)

Corey Forde, MBBS (Queen Elizabeth Hospital, Christ Church, Barbados)

Latania K. Logan, MD, MSPH (Rush University Medical Center, Chicago, IL)

Anurag Malani, MD (St. Joseph Mercy Health System, Ann Arbor, MI)

for the SHEA Board of Trustees

Word count: 1767 without references; 2511 with references
Background
Forty percent of COVID-19 related deaths in the United States have been linked to nursing homes (NHs) (1, 2). NHs commonly have limited access to infection prevention and control (IPC) experts, and are set up so that IPC duties are performed by a NH staff member or an infection preventionist (IP) with other responsibilities and little protected time. During the COVID-19 pandemic, NHs have faced challenges including inadequate infrastructure to support isolation units, difficulties in securing timely diagnostic testing, high staff turnover, space limitations, personal protective equipment (PPE) shortages, and frequently evolving guidance for prevention and treatment of COVID-19. This report outlines suggested models for collaboration, configuration, and controls to facilitate optimal preparedness and response for NHs during this pandemic and beyond.

Collaboration
Local healthcare collaborative relationships are essential for NHs, and each participant and the broader community benefits. Whether maintained on an ongoing or as-needed basis, collaboratives provide support and expertise to coordinate approaches, bridge supplies and resource gaps, prepare for patient influxes (e.g., from a nursing home to hospital), and lessen strain across the community.

Healthcare collaboratives ideally should include local NH facilities, local and state public health, health systems and hospitals, IPC and infectious diseases experts, and laboratories, and be able to expand. They are best if built before a crisis, but in places where collaboratives do not exist, the authors encourage local healthcare communities to form them now.

Configuration
State and local public health departments are best positioned to initiate collaboratives. They are informed in resource-sharing efforts and available funding, and can expand capacity by partnering with academic medical centers and hospital systems. Also, IPC experts and healthcare epidemiologists can work on behalf of public health to establish consulting structures with NHs.

The authors recommend that participants in the collaborative formalize the relationship with a written agreement. At minimum, the agreement should establish:

- Buy-in from each facility’s leadership
- Standards that foster trust, supporting mutual problem-solving and transparency, and providing protection against punitive actions
- Roles and responsibilities of participants.

Activities of the collaborative may include:

- Providing access to IPC experts when a COVID-19 case is identified in a NH
- Establishing preferred lines of communication for routine prevention, outbreaks, and crises
- Creating protocols for NHs to alert public health to shortages of supplies or capacity, and for public health to coordinate sourcing
- Coordinating transfers of residents with COVID-19 out of NHs that are unable to safely care for them.

Controls
Reinforce adherence to IPC standards (3), and designate staff members responsible for training and monitoring adherence among NH staff.

Symptom Screening
Identify signs and symptoms of COVID-19 in NH residents and staff members early. A single case of COVID-19 in the NH should prompt escalation in IPC procedures (4), testing, and exposure evaluations (5, 6).

All residents, staff, and visitors who are allowed in the facility should undergo daily temperature and symptom monitoring. Establish human resources policies for staff reporting, monitoring, and returning-to-work, and educate staff in symptoms of COVID-19, to include that temperature monitoring alone is insufficient.

Testing
Healthcare personnel (HCP) performing testing should wear appropriate PPE and be trained in specimen collection. Because of ongoing supply issues, NHs may decide to implement more than one type of test. HCP should be trained accordingly.

Factors to consider when choosing tests:

- Sensitivity/specificity
- Turnaround time
- Availability of specimen collection and test supplies
- Cost
Comfort. Nasopharyngeal (NP) swab collection can be uncomfortable and test refusal may become an issue. Other methods, such as oropharyngeal (OP) or anterior nares swabs may offer more comfort with comparable sensitivity.

The authors do not recommend for or against use of antigen testing in the NH population because of limited scientific information at this time. The Centers for Disease Control and Prevention (CDC) and Centers for Medicare and Medicaid Services (CMS) released guidance on antigen testing in NHs, and CMS is sending antigen testing kits to NHs with the expectation that they will be used to test asymptomatic staff (7). These tests have not been validated for screening asymptomatic individuals yet. NHs should be informed about test performance and perform confirmatory tests when needed. Considerations may include reported sensitivity and specificity of the test, pre-test probability of infection in the person tested (e.g. compatible symptoms, known exposures), and prevalence of COVID-19 in the facility or community.

NHs should test often, but frequency may change based on the type of test, rates of community transmission, and number of cases in the facility. Before relaxing mitigation strategies, CMS currently requires:

- Baseline testing of all residents
- Baseline and periodic testing for all staff, volunteers, and vendors
- Written protocols for testing, including actions for individuals who refuse or cannot consent to testing
- Arrangements with laboratories for timely test turnaround (8).

CDC no longer recommends repeat testing to discontinue isolation of individual patients (9). Residents with COVID-19 can be removed from isolation after 10 days from symptom onset if at least 24 hours have passed since the last fever without use of antipyretics, and with improvement in symptoms, or after 20 days for severely ill or immunocompromised individuals (9). The authors do not recommend that NHs require negative tests for discharge or transfer from the hospital.

**Cohorting, Isolation, and Contact Tracing**
A NH with an identified case of COVID-19 consequently has:

- Residents and/or staff with COVID-19*1
- Exposed and asymptomatic residents and/or staff
- Unexposed residents and/or staff.

---

*1 suspected or confirmed infection
The NH infection preventionist (IP) should be familiar with the process of contact tracing and be able to liaise with public health in order to identify residents and staff who were exposed to the positive case.

CDC guidance calls for caring for residents with COVID-19 in a dedicated unit with dedicated HCP (10); however, cohorting and isolation in NHs can be complex due to facility design, staffing shortages, and limited isolation rooms. A healthcare collaborative can help NHs prepare for and manage this.

NHs should have a cohorting and isolation plan that:

- Identifies a location for management of residents with COVID-19 (suspected or confirmed)*. If a NH cannot designate a whole unit or a section of a unit, it should assign dedicated staff to these residents with clear signage on rooms
- Prepares a staffing plan for consistent and dedicated staff for each cohort
- Documents IPC procedures and protocols for each type of cohort, including, as appropriate:
  - Isolation/quarantine
  - PPE use
  - Environmental cleaning/disinfection
  - Engineering controls
  - Audit and feedback processes
- Describes contingencies, e.g. increases in COVID-19 cases and staffing shortages.

**Personal Protective Equipment (PPE)**

Appropriate use of PPE by HCP, staff, residents, and visitors helps prevent the transmission of COVID-19 in NHs (see Table 1).

**Universal Precautions**

Practice universal precautions during the pandemic for source control. These applies to:

- All NH staff members should wear face coverings. For HCP, this includes:
  - Medical masks
  - Eye protection, in settings with moderate to substantial community transmission. It is considered optional for settings with minimal to no community transmission, unless otherwise indicated as part of standard precautions (11). The authors note that when worn at all times except in a private office, universal eye protection may be used as a method to prevent HCP-to-HCP transmission.
- Residents should wear face coverings, if tolerated, when interacting with HCP, staff, residents, or visitors. When feasible, medical masks are preferred.
- Visitors allowed in the facility should wear face coverings. A visitor in direct contact with resident(s) should wear a medical mask rather than a cloth mask.
Transmission-Based Precautions
For direct care of residents with COVID-19*, HCP should wear medical masks, eye protection, gowns, and gloves (11, 12). HCP may alternatively wear fit-tested N95s instead of medical masks (11, 12); however, many NHs face limitations in maintaining fit testing programs, and when supplies are constrained, N95s should be reserved for HCP performing aerosol-generating procedures (AGPs) as outlined below.

Precautions for Aerosol-Generating Procedures
When performing an AGP (for example, use of a nebulizer, bilevel positive airway pressure, or continuous positive airway pressure) on a resident with COVID-19*, HCP should wear an N95 or equivalent, eye protection, gown, and gloves. In settings with ongoing or widespread community transmission, consider this combination for all AGPs regardless of a resident’s COVID-19 status, if supplies permit.

Maintaining Supply and Managing Shortages
Apply a multi-pronged approach to optimize PPE and avoid shortages:

- Designate staff member(s) to:
  - Steward PPE supplies, including use of a PPE burn rate calculator
  - Monitor donning and doffing
  - Provide feedback
- Bundle resident care activities to minimize entries into residents’ rooms
- Establish policies to extend use, reuse, and decontaminate PPE

Ventilation
Know about the building’s ventilation system, including the HVAC filter level (current and highest level achievable), outdoor air dampener settings, areas with negative/positive pressure, the number of air changes per hour in rooms and common spaces, and when and how long the system runs (13). Professional evaluation may be needed to determine air circulation patterns, risk of re-circulated air, and whether air travels between areas with residents with COVID-19*, other residents’ spaces or rooms, and staff areas.

Staffing
All NH staff members are potential vectors of COVID-19, especially during periods of active community transmission. They often work at multiple facilities, increasing the risk of intra- and inter-facility spread. Many NHs experience high staff turnover, leading to a less experienced workforce and employment of

*suspected or confirmed infection

2
ancillary staff or volunteers. Reports of NH outbreaks of COVID-19 identified staff who worked while symptomatic and inadequate knowledge of IPC precautions as potential causes of transmission (14).

CDC recommends at least one full-time IP for NHs with >100 residents and/or NHs with ventilators or hemodialysis capabilities (12). NH administration should provide its IP(s) with dedicated, protected time.

NHs should also, regardless of size, provide IPC education for at least one full-time staff member annually, and training in IPC practices for all staff (12).

**Physical Distancing**
Outbreaks in NHs also have been traced to staff interactions in non-resident care areas. Staff should wear masks in all shared work rooms, break rooms, administrative offices, and nursing stations when in the presence of another person in that space, and take meals and snacks alone or outside with appropriate distancing, or add engineering controls (e.g. room dividers, plexiglass). Physical distancing should be practiced, especially while eating or drinking.

**Conclusion**
The COVID-19 pandemic has led to unprecedented challenges for NHs. Anticipating a second wave, the authors urge the creation of formalized collaborative relationships between NHs, public health, and local hospitals and labs. In addition, the US needs a national strategy for resource allocation, program development, management, and staff and patient protection in partnership with local and state health departments to increase funding, reporting, and regulation for NHs.

**Acknowledgements**
The authors report no conflicts of interest relevant to this article.
References


### Table 1.

<table>
<thead>
<tr>
<th></th>
<th>HCP</th>
<th>Non-HCP staff</th>
<th>Residents</th>
<th>Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Universal precautions</strong> <em>(at all times, in all spaces of facility and grounds)</em></td>
<td>- Medical mask</td>
<td>- Medical mask, if interacting with resident(s)</td>
<td>If tolerated, medical mask preferred when interacting with HCP, staff, residents, or visitors, or cloth mask acceptable</td>
<td>- Medical mask, if interacting with resident(s)</td>
</tr>
<tr>
<td></td>
<td>- Consider eye protection</td>
<td>- Medical mask, if interacting with resident(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ongoing community transmission and/or new/first case detected in NH</strong></td>
<td>- Medical mask</td>
<td>- Medical mask or cloth mask acceptable, if not interacting with resident(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Eye protection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Gown</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Gloves</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Care of resident with COVID-19</strong></td>
<td>- Medical mask or N95**³</td>
<td></td>
<td></td>
<td>Medical mask (e.g. end of life visit)</td>
</tr>
<tr>
<td></td>
<td>- Eye protection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Gown</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Gloves</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AGP on resident with COVID-19</strong></td>
<td>- N95</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Eye protection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Gown</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Gloves</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AGP on resident without COVID-19</strong></td>
<td>- Medical mask or N95**</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>- Eye protection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Gown</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Gloves</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

³ **if supplies permit**