


# A Hospital Partnership with a Nursing Home Experiencing a COVID-19 Outbreak: Description of a Multiphase Emergency Response in Toronto, Canada

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Nursing homes have become “ground zero” for the coronavirus disease 2019 (COVID-19) epidemic in North America, with homes experiencing widespread outbreaks, resulting in severe morbidity and mortality among their residents. This article describes a 371-bed acute-care hospital’s emergency response to a 126-bed nursing home experiencing a COVID-19 outbreak in Toronto, Canada. Like other healthcare system responses to COVID-19 outbreaks in nursing homes, this hospital–nursing home partnership can be characterized in several phases: (1) engagement, relationship, and trust building; (2) environmental scan, team building, and immediate response;

(3) early-phase response; and (4) stabilization and transition period. *J Am Geriatr Soc* 68:1376-1381, 2020.

## BACKGROUND

Nursing homes have become “ground zero” for the coronavirus disease 2019 (COVID-19) epidemic in North America.<sup>1</sup> In both the United States and Canada, the first recorded COVID-19 deaths and outbreaks occurred in nursing homes, with case fatality rates in these settings reported to be as high as 33.7%.<sup>2</sup> Since that time, more than 25,000 nursing home residents have died of COVID-19 in the United States, whereas more than 80% of all COVID-19 deaths in Canada are among nursing home residents.<sup>3,4</sup>

There are several reasons why nursing home residents are at disproportionately high risk of contracting severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)—the causative agent of COVID-19—and related morbidity and mortality. First, nursing homes house a large number of frail older adults—often within shared rooms or with shared bathrooms—which predisposes to rapid transmission of SARS-CoV-2.<sup>2</sup> Second, early infection prevention and control (IPAC) strategies focused on screening and testing symptomatic nursing home residents, yet many who swab positive for SARS-CoV-2 are presymptomatic at the time of testing.<sup>5</sup> Further, screening for COVID-19 tends to emphasize fever and respiratory symptoms, yet frail older adults are more likely to have “atypical presentations” of COVID-19, such as delirium, falls, and function decline.<sup>6-8</sup> Third, severe COVID-19 infection occurs more commonly among older adults and those with underlying chronic conditions, features that define most of nursing home residents.<sup>9,10</sup> In Canada, nursing home residents have an average age of 82 years, most experience multimorbidity, with nearly 70%

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having dementia, and they take an average of 10 medications a day.<sup>11,12</sup>

In Canada's most populous province of Ontario, nearly 80,000 individuals live in more than 625 nursing homes.<sup>13</sup> At the time of writing, there were 274 cumulative COVID-19 outbreaks in Ontario nursing homes, resulting in the deaths of 1,389 nursing home residents and 5 staff members.<sup>14</sup> Before the pandemic, Ontario nursing homes and acute-care hospitals had no prescribed relationships, and they continue to be regulated by independent ministries. In response to the evolving crisis, the Government of Ontario took the extraordinary step of asking hospitals to develop and deploy specialized "COVID-19 SWAT teams" from hospitals to provide additional staffing, IPAC, occupational health, and operational support to nursing homes.<sup>15</sup> Absent a roadmap for the partnership, our 371-bed acute-care hospital developed a multiphase emergency response to a 126-bed nursing home experiencing a COVID-19 outbreak in Toronto, Canada.

### SITUATION AT THE ONSET OF THE ACUTE-CARE HOSPITAL AND NURSING HOME PARTNERSHIP

When a partnership was established between the hospital and the nursing home on April 15, 2020, the home was already 16 days into a substantial COVID-19 outbreak. The nursing home had declared an outbreak on March 31, 2020 (defined in the province of Ontario as at least one infected resident or staff member), and by April 15, 2020, there were 89 infected residents, resulting in 12 deaths and 47 infected staff members. Like other healthcare system responses to COVID-19-related nursing homes crises, this hospital-nursing home partnership can be characterized in several phases: (1) engagement, relationship, and trust building; (2) environmental scan, team building, and immediate response; (3) early-phase response; and (4) stabilization and transition period.<sup>16</sup>

### PHASE 1: ENGAGEMENT, RELATIONSHIP, AND TRUST BUILDING

Before the hospital's partnership, the nursing home had made several requests and advocated with a variety of organizations and governmental agencies, seeking immediate assistance in managing the COVID-19 outbreak; unfortunately, none of these interactions translated into meaningful assistance, and the home had developed a lack of trust toward outside help. Recognizing the well-established evidence highlighting trust as the "vital ingredient for effective emergency response teams" across a variety of settings, relationship and trust building were the key principles in our emergency response.<sup>17</sup> The relationship and trust-building process involved thoughtful listening by the hospital about the urgency of the situation within the nursing home and collaborative problem solving on tangible ways for the hospital to offer assistance within hours. Through this process, both the gravity of the situation in the home as well as the nature of the immediate response required became evident, setting the stage for a codesigned multiphase emergency response.

### PHASE 2: ENVIRONMENTAL SCAN, TEAM BUILDING, AND IMMEDIATE RESPONSE (FIRST 72 HOURS)

Building on the relationships and trust we established, phase 2 (detailed in Table 1) started with an environmental scan of the needs of the nursing home. Immediate needs identified included more direct access to palliative care, geriatric medicine, and IPAC clinicians to support the nursing home's long-term care physicians. There was also a need for staffing, and the hospital's human resources and occupational health leads worked with the home to understand the current and projected staffing shortages. The environmental scan also determined the nursing home's personal protective equipment (PPE) stockpile, supply chain, and expected burn rate as well as shortages and expected needs for medical equipment (e.g., vital sign monitoring machines, pulse oximeters, and oxygen tanks) and medications.

We also established an interdisciplinary clinical and operations team to oversee and execute the emergency response. Members of the hospital team included clinicians in geriatric medicine, palliative care geriatric psychiatry, IPAC, pharmacy, and nursing as well as senior leadership and administrators from nursing, IPAC, occupational health and human resources, materials management, and environmental services. The full list of team members, roles, and responsibilities is detailed in Supplementary Appendix S1. Daily operations meetings occurred throughout the duration of the

**Table 1. Environmental Scan, Team Building, and Immediate Response (First 72 Hours)**

1. An environmental scan of clinical expertise, staffing, supplies, and equipment needs <ul style="list-style-type: none"> <li>○ Securing direct access to geriatric medicine, palliative care, and IPAC clinicians.</li> <li>○ Evaluating current and projected nursing home staffing shortages.</li> <li>○ Determining the PPE stockpile, supply chain, and expected burn rate.</li> <li>○ Assessing shortages and expected needs for medical equipment and medications.</li> </ul>
2. Immediate infection prevention and control assessment <ul style="list-style-type: none"> <li>○ Reviewing the outbreak line list and plotting its epidemiological curve.</li> <li>○ Risk assessment to understand any gaps in IPAC measures and procedures.</li> </ul>
3. SARS-CoV-2 testing of the remaining residents at the nursing home <ul style="list-style-type: none"> <li>○ Widespread SARS-CoV-2 nasopharyngeal swabbing.</li> </ul>
4. Team building: establishing a clinical and operations team <ul style="list-style-type: none"> <li>○ Members of the hospital team included senior leadership, administrators, nurses, and clinicians in geriatrics, palliative care, psychiatry, pharmacy, and IPAC. The full list of team members, roles, and responsibilities is detailed in Supplementary Appendix S1.</li> </ul>
5. Decanting of 15 nursing home residents to the acute-care hospital <ul style="list-style-type: none"> <li>○ The nursing home and hospital agreed to decant 15 residents who were receiving end-of-life care or who would benefit from acute-care medical management.</li> </ul>

Abbreviations: IPAC, infection prevention and control; PPE, personal protective equipment; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

emergency response, and the team liaised closely with the local Public Health Unit (PHU).

The immediate response involved widespread SARS-CoV-2 testing of the remaining nursing home residents and an urgent IPAC risk assessment. The hospital-based IPAC team met with the local PHU to understand and review the scope of the nursing home outbreak, and worked with the home to identify any gaps in recommended IPAC measures and procedures.<sup>18,19</sup> Finally, recognizing the severity of the COVID-19 crisis within the nursing home as well as critical staffing shortages, an agreement was made to immediately decant 15 residents (>15% of the remaining residents in the home) to the acute-care hospital for inpatient admission.

### PHASE 3: EARLY-PHASE RESPONSE (NEXT 7 DAYS)

At that time, the nursing home was experiencing its peak of COVID-19 resident deaths, so phase 3 of the emergency response (detailed in Table 2) focused on establishing the infrastructure for virtual care, clinical triage of the remaining residents, and the emergency provision of palliative and medical care. Virtual care is a recognized means of improving healthcare delivery in public health emergencies and was an ideal tool for this response to minimize staff exposure, the PPE burn rate, and SARS-CoV-2 transmission between the hospital and the nursing home.<sup>20</sup> The virtual care infrastructure included remote access to the nursing home's electronic medical records, tablet computers donated by the hospital (with plastic cases and screen covers that could be cleaned between resident interactions), and secure video communications software.<sup>20</sup>

Once this infrastructure was established, the clinical team urgently triaged the remaining nursing home residents to identify those who were medically unwell and at the end of life.<sup>21</sup> This involved a rapid and systematic review of residents' medical records, screening by the nursing home staff using a tool we developed (Supplementary Appendix S2), and virtual rounding—prioritizing those residents flagged by chart review and the screening tool—with an on-site registered practice nurse.<sup>22,23</sup> When a resident was identified as being medically unwell or at the end of life, the team immediately pursued a goals-of-care conversation to understand the resident and/or substitute decision maker's illness understanding, values, wishes, treatment goals (i.e., active medical management or comfort-based care), and preferred place of care (i.e., transfer to hospital or remain in the nursing home); almost all residents chose to remain in the home.<sup>22</sup>

Active medical management included access to STAT in-home blood work and x-ray imaging, hypodermoclysis for dehydration, and low-flow supplemental oxygen for hypoxia, emphasizing that this posed no risk of SARS-CoV-2 aerosolization or transmission.<sup>24</sup> The provision of palliative care involved assessment and management of commonly experienced COVID-19 end-of-life symptoms, including dyspnea, respiratory congestion, pain, nausea, and delirium, and regular contact with families to provide emotional support during the dying process, including suggestions about how to be present with their dying loved one using technology.<sup>21,22</sup>

**Table 2. Details About the Early-Phase Response (Next 7 Days)**

1. Establishing the infrastructure for the provision of virtual care
  - Telehealth (videoconferencing and remote access to the electronic medical record) was used to reduce staff exposure to SARS-CoV-2 and minimize the PPE burn rate.
2. Clinical triage of the remaining residents in the home
  - Medically unwell and end-of-life residents were rapidly identified by chart review and by a screening tool we developed for the nursing home staff (see Supplementary Appendix S2).
  - The clinical team virtually rounded with an on-site registered practice nurse on residents, prioritizing those who were potentially medically unwell or at the end of life.
3. Goals-of-care discussions for residents determined to be unwell or at the end of life
  - Goals-of-care conversations were had with all nursing home residents (and their family members/proxies) identified as being medically unwell or at the end of life.
  - Decisions were made about active versus medical management and transfer to the acute-care hospital versus remaining in the nursing home.
4. Provision of active medical management within the nursing home
  - STAT and in-home laboratory and imaging services were organized.
  - Hypoxic residents were given low-flow oxygen therapy (maximum of 5 L/min).
  - Volume contracted residents were rehydrated using subcutaneous hypodermoclysis.
  - A geriatrician and palliative care physician were available 24/7 to respond to any clinical concerns or emergency situations.
5. Provision of high-quality palliative care within the nursing home
  - Residents identified as being at the end of life and wishing to remain within the nursing home for comfort care were assessed on at least a daily basis via virtual care.
  - We helped ensure an adequate supply of comfort care and subcutaneous medications.
6. IPAC training for frontline staff
  - Several on-site training sessions, focusing on modes of transmission of COVID-19, point-of-care risk assessment, PPE selection, and donning and doffing procedures.
7. Ongoing IPAC interventions
  - Additional SARS-CoV-2 testing.
  - Room changes and terminal cleans.
  - Enhanced environmental cleaning and disinfection.
  - Setting up donning and doffing stations and increasing access to PPE and hand hygiene.
8. Occupational health
  - The occupational health team worked with IPAC, the local Public Health Unit, and the nursing home to connect with and support staff away from work for any reason (illness, caregiving responsibilities, or fear) and determine a plan for return to work.

Abbreviations: COVID-19, coronavirus disease 2019; IPAC, infection prevention and control; PPE, personal protective equipment; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

The early-phase response also involved intensive IPAC interventions, including several on-site training sessions for all nursing home staff providing education on SARS-CoV-2 transmission, point-of-care risk assessment, PPE selection, and donning and doffing procedures. The IPAC team advised on additional SARS-CoV-2 testing (to clear

previously infected residents), room changes and terminal cleans (to protect COVID-19–negative residents), environmental interventions (cleaning of high-touch surfaces and optimizing cleaning products and schedules), setting up donning and doffing stations, and increasing access to PPE and hand hygiene.

#### PHASE 4: STABILIZATION AND TRANSITION PHASE (DAY 10 TO PRESENT)

By the onset of phase 4 (detailed in Table 3), there were no further unanticipated resident deaths or transfers to hospital, and the outbreak was stabilizing. This phase focused on alleviating staffing shortages, optimizing the medical and psychiatric care of residents, providing psychosocial support for the nursing home's staff, and preparing the home for a transition back to more autonomous clinical care and management.

Given the extreme staffing shortages, the hospital redeployed 12 of its nurses for a 4-week assignment at the nursing home. Before redeployment, these nurses were provided with an intensive orientation and “shadowing” experience to prepare them for work in the nursing home environment.

**Table 3. Details About the Stabilization and Transition Phase**

1. Deployment of hospital-based nurses to alleviate staffing shortages
<ul style="list-style-type: none"> <li>○ The hospital redeployed one clinical nurse specialist, four registered nurses, and seven registered practice nurses for a 4-week assignment at the nursing home.</li> </ul>
2. Pharmacist intervention for nursing home residents
<ul style="list-style-type: none"> <li>○ Medication administration schedules were consolidated and streamlined to minimize staff exposure and PPE burn rate.</li> <li>○ Comprehensive medication reviews to optimize medication safety and resident care.</li> </ul>
3. Psychiatric support for nursing home residents
<ul style="list-style-type: none"> <li>○ Geriatric psychiatry consultations to residents with new mental health concerns and reassessment and optimization of treatment plans for those with preexisting mental illness and cognitive impairment.</li> </ul>
4. Psychosocial support for the nursing home staff
<ul style="list-style-type: none"> <li>○ The hospital psychiatry group offered one-on-one and group-based counseling.</li> </ul>
5. Stabilizing IPAC interventions within the nursing home
<ul style="list-style-type: none"> <li>○ Screening all asymptomatic staff and clearing residents who had recovered from COVID-19 based on symptom onset.</li> <li>○ Ongoing support around PPE selection, donning and doffing, and environmental cleaning, to ensure a continued safe environment for staff.</li> </ul>
6. Transitioning of medical care back to the nursing home staff and physicians
<ul style="list-style-type: none"> <li>○ Coaching and empowering the nursing home staff to monitor and manage geriatric and palliative syndromes as well as pursue goals-of-care conversations.</li> <li>○ The nursing home's family physicians started joining virtual rounds, and eventually began rounding independently using the newly established virtual care infrastructure.</li> </ul>

Abbreviations: COVID-19, coronavirus disease 2019; IPAC, infection prevention and control; PPE, personal protective equipment.

A geriatric hospital pharmacist also started participating in clinical team rounds. Recommendations were made to consolidate and limit medication administration times to decrease the risk of SARS-CoV-2 exposure to staff and the PPE burn rate. This included switching medications to less frequently dosed formulations or reducing dosing frequency, aligning administration times to bundle with timing of other resident care tasks, and deprescribing nonessential medications.<sup>25</sup> The pharmacist also performed comprehensive medication reviews to optimize medication safety and resident care.

Like others, we observed that the nursing home outbreak triggered incident mental health problems and worsened existing psychiatric symptoms among residents.<sup>26</sup> In particular, residents with cognitive impairment experienced challenges and distress with the isolation and frequent room changes required for outbreak management.<sup>27</sup> The team's geriatric psychiatrist provided virtual consultations to residents with new mental health concerns while also liaising with nursing home-based mental health clinicians to reassess and optimize treatment plans for residents with preexisting mental illness and cognitive impairment. This included strategies for the effective and compassionate isolation of residents with COVID-19 and dementia who were prone to wandering.<sup>27</sup>

Another major effort involved providing psychosocial supports for the nursing home staff. Recognizing the staff's psychological stress as a result of caring for vulnerable and dying residents, navigating rapidly changing IPAC guidance, and worrying about their own health and safety, the hospital's psychiatry group offered individual and group-based counseling to the nursing home staff.<sup>28</sup> A psychiatrist and clinical nurse specialist also joined daily rounds to offer point-of-care support and to continue fostering relationship building and trust between the nursing home and hospital teams.

Finally, there were several stabilizing interventions to facilitate the nursing home's transition back to more autonomous clinical care and management. This included the IPAC team and PHU overseeing the testing of all asymptomatic nursing home staff and clearing residents who had recovered from COVID-19. The clinical team also coached and empowered the nursing home staff to monitor and manage geriatric and palliative syndromes and pursue goals-of-care conversations. In this phase, the nursing home's family physicians started joining virtual rounds, and eventually began rounding independently using the newly established virtual care infrastructure.

#### DISCUSSION AND THINKING AHEAD

Even in the midst of the COVID-19 pandemic, many nursing homes are still underprepared and underequipped to manage outbreaks within their homes.<sup>29</sup> Recognizing this, there is an urgent need for real-time data and experiences of nursing home interventions during the pandemic to help inform effective responses worldwide. This hospital and nursing home partnership demonstrates that it is not too late for health systems to regroup and restructure to help homes survive the surge of COVID-19 outbreaks.<sup>30</sup> Indeed, other countries, like Singapore, radically retooled the organization and provision of care within their long-term care

sector, and did not experience a single case of SARS-CoV-2 transmission within their nursing homes.<sup>31</sup>

This multiphase emergency response highlights how hospital and nursing home administrators and clinicians can effectively collaborate to manage a large COVID-19 outbreak and ideally prevent the risk of future outbreaks. The key principles of this intervention included a phased response that emphasized relationship and trust building; a robust clinical and operations team with central input from geriatric medicine, palliative care, IPAC, psychiatry, nursing, as well as senior hospital leadership and administration; and a nonhierarchical and collaborative approach to working with the nursing home staff and most responsible family physicians.

Although COVID-19 has devastated nursing homes across the world, we do hope that responses like ours can be a model for other homes in crisis. It is also critical that governments and policy makers recognize that their support is not only needed now, but well beyond the pandemic to fundamentally redesign and modernize the long-term care sector.<sup>30</sup>

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## SUPPORTING INFORMATION

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

**Appendix S1:** Clinical and Operations Team Organizing and Executing the Multiphase Emergency Response

**Appendix S2:** A COVID-19 Pandemic Assessment and Triage Tool for Resource-Constrained Nursing Home Outbreak Settings