

# DEALING WITH OUTDATED NURSING HOME DESIGN IN THE AGE OF COVID-19

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**A**lthough many factors have played a role in the rapid spread of the SARS-CoV 2 virus in nursing homes, physical design, especially overcrowding, is one of the key factors. Many facilities still house multiple residents in one room, a condition which makes it more difficult to contain respiratory viruses, says Dr. Nimalie Stone, medical epidemiologist for long-term care in the Division of Healthcare Quality Promotion at the Centers for Disease Control and Prevention (CDC). “We are seeing the SARS-CoV 2 virus take advantage of some of the weaknesses in our environment of care and our capability of preventing spread that were being understood and addressed even before the pandemic.”

She points out that there’s a clear association between crowded nursing homes and the spread of the SARS-CoV 2 virus, the virus that causes COVID-19. (Recent research found that the incidence of COVID-19 and the mortality rates in crowded nursing homes in Ontario was more than double that of low crowding homes. The study, which was published in JAMA Internal Medicine, also found that outbreaks tended to be larger.)

## Different Models of Elder Care

Beyond the typical skilled nursing facility, there are other models of seniors housing – and some of these seem to have been designed with infection prevention and social distancing in mind. For instance, at the time of writing, Atria Senior Living was in the final stages of redeveloping a former two-building skilled nursing facility in Newport Beach, California into a high-end senior living community. Its plans feature apartments with full-size refrigerators and cooktops, Juliet balconies, communal dining venues with walls that open to the outside, and a covered outdoor dining space.

In the Chicago area, Innovative Health is part way through opening three skilled nursing facilities in which multiple units can be closed off and work independently from each other. In British Columbia, Baptist Housing is working on plans for the first phase of its Inglewood Care Centre redevelopment. It will include a separate elevator for visitors that will lead onto a multi-purpose room where residents can gather, or, in times of a pandemic or influenza outbreak, visit one-on-one with family members.

Meanwhile, this article about post-pandemic senior housing design talks about possible long-term changes in the elder care industry, such as decentralized nursing homes, more satellite communities and more square footage to accommodate activities and amenities. There’s also neighborhood design, which takes a leaf from the Green House Project, by creating small clusters of residents, each with their own room, who are separated from other residents in the community.

## Different Approaches for Different Budgets

When it comes to nursing homes, Drew Roskos, an award-winning architect who designs senior living

communities, is aware of the “delicate balance” between creating a space that best serves the population and keeping the budget balanced. If budget is not an issue, he is in favor of decentralizing amenities—creating many smaller dining and other communal spaces instead of relying on one main space. As well, he recommends providing varied and dispersed outdoor experiences, such as gardens and walking areas, in addition to a main courtyard. He also supports visitation rooms if they have good air exchanges and dividers and it’s easy for residents to socially distance from visitors.

Although it’s more difficult to renovate an existing occupied community, operators can pick the most impactful upgrades through the help of a design and construction team, says Roskos, adding that they should also consider changing the way existing space is used. For example, when the risk of transmission is high, operators could temporarily turn a fitness room into a small dining area or a craft area. In general, it’s easier and more economical to have the kitchen operations as close to the dining area as possible, he notes, adding that many operators still use one dining room though they may ask residents to dine in shifts. (As well, some facilities have chosen to stop serving residents in dining rooms, instead delivering meals directly to their rooms, while others enforce socially distancing in the dining hall.)

Installing plexiglass at reception desks is another way providers can reduce the risk of transmission, says Roskos, who notes that dividers can be removed when the risk of COVID-19 is low and brought back during flu season. As well, he encourages operators to invest in a dedicated telemedicine room with an examination table. “The increase in telemedicine has been dramatic and has been helpful in preventing people [from] going to the hospital or to the doctor for minor issues,” he notes. Although some telemedicine appointments could take place in a resident’s room, certain things need to be addressed on an examination table, he notes. (Operators should also look at creating attractive staff environments, he mentions, adding that staff rooms tend to be “second rate.”)

### Improving Air Quality

Given that SARS-CoV-2 viral particles spread between people more readily indoors than outdoors, improving air quality is another factor that should be top of mind. To improve air quality, providers can provide better filters within their system or increase the number of air exchanges, says Roskos, adding that this can be done relatively easily, though it can be costly. Isolating wings by creating negative pressure – which involves penetrating walls or windows to create an opening so airborne particles can’t be transmitted to other areas—can be messy and can limit daylight or ruin windows, he says. “It’s not without sacrifice, but it can be done.” When renovating you need to be mindful of the impact that the construction will have on frail and elderly people residents, he says. “Ripping everything out and putting in new materials is going to be obviously disruptive

to the operation and then costly to the budget.”

Adding ultraviolet light protection or ionization to the duct systems has potential for both new construction and renovation projects, he says, adding that data on case studies may soon be available. (For more about ionization, check out the American Society of Heating, Refrigerating and Air-Conditioning Engineers website.)

A number of ventilation mitigation strategies are listed on the CDC website, such as ensuring that restroom exhaust fans are functional and using portable HEPA fan/filtration systems. The CDC also notes that specially designed Germicidal Ultraviolet (GUV) fixtures can be mounted on walls or ceilings to disinfect air as it circulates. Other options include in-duct GUV systems, which can be installed within a HVAC system, or Far-UV, an emerging technology that has become popular since the pandemic. (Scroll down the CDC’s Ventilation FAQs page to read about GUV.)

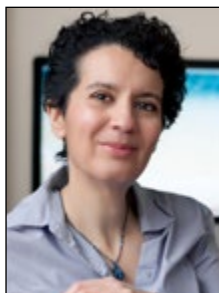
### Enhanced Cleaning Protocols

Whether a provider is renovating an existing facility or building new construction, it’s more impactful to invest in touchless technology and better cleaning protocols than in an abundance of antimicrobial surfaces, says Roskos. With touchless technology, he advises focusing attention and dollars on high-touch areas, particularly entrances, perhaps adding automatic operators or motion sensor to doors.

Dr. Stone notes that privacy curtains can also provide a partial barrier against infectious diseases if they are cleaned and disinfected properly. “They have a role, but it has to be done in a smart way.” She also says that installing alcohol-based hand rub dispensers in common areas and in resident care hallways and rooms allows staff to quickly clean their hands when they are changing PPE, which can cut down on the transmission of viruses. “It’s just following the basics, cleaning the equipment that we move, cleaning our hands before we move, and being very diligent about the environmental surfaces, especially those that are very high touch, the things that people have immediately around them, like a bedside table or TV remotes,” she says. 🧼

### More Resources

- CDC YouTube video: Sparkling Surfaces – *Stop COVID-19’s Spread*
- Infection Control Today: Q&A – *How to Build a Negative Pressure Wing in a Nursing Home—Fast!*



Katherine O'Brien is a freelance writer/editor/ghost-writer in the B2B/B2C health, aging and non-profit sectors who creates content that engages and educates target audiences and sells brands. She has written about advanced health and medical topics like dementia, cancer and aging for both general audiences as well as healthcare professionals and administrators.