



HEALTHCARE PANDEMIC PLANNING

JULY 2020



REAL **COLLABORATION**
REAL **PERFORMANCE**
REAL **INSPIRATION**

/HEALTHCARE PANDEMIC DESIGN

As the nation grapples with this current COVID-19 pandemic, it is important to take the knowledge and experiences that have been gained and use that to inform future design to better equip facilities for the next pandemic. It is likely the conditions of the pandemic (how it is transmitted, how many will be infected, the physiological impacts, etc) will be different than the current one so there may need to be different scenarios run to best inform decisions around flexibility and resiliency.

The following information is a starting point as every facility and health system will have to evaluate their current condition and what level of **PREPARATION, FLEXIBILITY & RESILIENCY** they desire.

This pandemic reinforced the need of digital documentation of a facility's infrastructure. As facilities locked down, the opportunity for architects, engineers and other professionals to enter the buildings was reduced or eliminated. In some cases the risk factors for those people, even if permitted by the facility, precluded them from entering. Assisting facilities in pandemic preparation was hampered and delayed, and additional people were put at risk to investigate infrastructure due to a lack of knowledge and documentation.

Facilities staff were overwhelmed

in preparing their buildings for response. They did not have time to help investigate or look for plans. Creating and maintaining current infrastructure plans is one of the best investments a facility can make in preparing for a pandemic or many other situations that are more commonly planned for (construction, natural disaster, power outage, etc).

*It should not take a pandemic
to get infrastructure documented.*

SCALE OF RESPONSE

- INFECTED POPULATION

For all scale of response, consider how the disease is transmitted, the level of PPE necessary and the impact an infected population will have to operations. It's not only about the patient but also the staff. Will they need an off site living space (if they can't go home) for example. This discussion may need to go broader to the community. Has any discussion occurred with any outside partners in response to a pandemic?



SMALL

- Just a few rooms or a whole ward
- Determine where patients currently residing in the space would be transferred to. If a ward, how will that impact traditional patients that would normally go in that space? For example, if the ICU is converted to a pandemic response ward, where do non-infected ICU patients go?
- What if it is not acceptable to mix these types of populations?



MEDIUM

- Multiple wards
- Are there clean and infected areas of the hospital?
- Determine if it is okay to mix these types of populations. How are services accessed for both clean and infected patients? (ie imaging, surgery, etc)



LARGE

- Surge facilities (convention centers, universities, hotels).
- Medical office buildings.
- To protect an uninfected population, review if some services can be moved off site. For example, it may be beneficial to move mother/baby to a surgery center.

/SITE

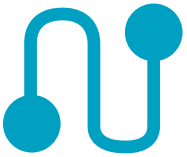
- Power/water/technology on site or in parking garages to accommodate testing, triage, decontamination, etc.
- Evaluate entrances on campus for staff, patients and visitors.
- Site Security

PATIENT - VISITOR PATH



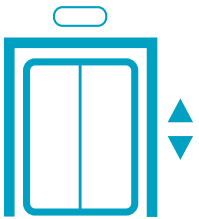
CHECK IN STATIONS

- Consider offering multiple entrances. Staff vs Public
- Wellness check (ie temperature scan)
- PPE distribution



PATIENT PATH

- Consider the patient path from point of entry (main entry, ED or other) to pandemic room/ward. and how they will be protected.
- What are other potential service needs? What is the pathway to those and how are people protected? (ie imaging, surgery, etc)



ELEVATORS

- Limit the number of people permitted in an elevator.
- Consider the addition of more elevators or if larger elevators are needed to facilitate movement while keeping social distancing.
- Determine if there is a need for separate clean, dirty, visitor and staff vertical transportation.



/PATIENT TREATMENT SPACES

PHYSICAL SPACE

- Consider physical barriers (doors/walls) for wards to allow for pressure relationships if needed.
- Operating room(s) – How will infected patients be operated on? Does a surgical space need to be created that can be positive to keep sterile but negative to surrounding areas? If an ante room is required, it is temporary or permanent? What about C-Section rooms?
- If a pandemic ward is created, consider additional staff amenities such as shower or respite areas within the unit to accommodate longer shifts or limit exposure to others.
- Consider ante rooms instead of wards, floors or spaces that are pressurized for specific use.



PLUMBING / MEDICAL GASES

- Oxygen, air, vacuum needs. How should ventilators be considered for pandemic wards?
- Think about zoning, especially if creating wards
- Hands free fixtures
- Evaluate natural gas sizing/piping to accommodate 100% outside air if needed.
- Consider contaminated water supply (virus, bacteria, or other)
 - Onsite water backup
 - Water cleaning system

HVAC

- 100% outside air (OA) vs negative spaces
- Isolation rooms vs wards
- In new design, consider dedicated AHU's by area or floor
- How is patient room pressure control implemented in a ward – are air control valves on supply, return, and exhaust required?
- Humidity – Consider being able to control through all seasons up to 60% as humidity can impact virus transmission
- Air Cleaning systems:
 - UV
 - Bi-polar ionization
 - Dry Hydrogen
 - Others
- Need to evaluate pumps/coils/piping sizing and chiller and boiler capacity to go to 100% OA

ELECTRICAL

- Indigo Clean or other similar technologies
- Electrical capacity to run chillers/boilers/electric heat for 100% OA
- Touch free switching

/PATIENT TREATMENT SPACES CONT.

TECHNOLOGY

Telehealth

- Space and infrastructure to support this service.

Asset tracking

- If an employee is exposed or there is not an initial diagnosis, tracking items they may have been in contact with.

Patient – Care Giver interaction

- How can technology be utilized to minimize trips into the room.
 - Remote control of functions in the space (lighting, thermostat, shades, TV, etc).
 - Robust communication both audible and visual.
 - Technology for basic caregiving such as vitals.

Patient – Family / Visitor interaction

- Remote communication either within the hospital or from the outside in. Cameras / Monitors in room to have a “facetime”.

Onsite Navigation

- Check in and notification to a device when they are ready to be called back.
- Map app within location to give direction to where you are going.
- Monitors showing number of people in spaces or air flow of room.

Facilities

- The ability to monitor the building remotely.

OTHER SPACES / CONSIDERATIONS

- Increase hands free operations. More autodoors. Hands free switches for lights, shades, thermostats.
- Necessity for more on site storage for additional PPE or other supplies.
- Morgue / holding capacity
- Conference rooms / work space arrangement for social distancing.
- Waiting with social distancing. Is waiting needed at all? Update the process to limit / eliminate waiting.
- Telehealth Space
- Material types for cleaning or resistance to viruses. There are many products on the market that include anti-microbial finishes or are better for cleaning.



MEDICAL OFFICE - **OUTPATIENT FACILITIES**

Some of the previous items can be evaluated for outpatient facilities but as discovered during the COVID-19 response, there are unique opportunities for these facilities.

Telehealth

- What is the impact to the size of the space/ number of exam rooms?
- Properly designed space (lighting, technology, etc) to conduct telehealth visits.
- Design of waiting spaces or elimination of waiting spaces to accommodate social distancing.

Use of space during a pandemic

- Are “clean” inpatient functions moved to this location (ie maternity, immune suppressed, cancer care)
- Surge site – What infrastructure or features should be put in place now to provide flexibility.
- Staff housing – Is there a place that can accommodate staff who can’t return home due to risks.
- Better Filters (MERV 14) even if not downstream of cooling coil.

/SENIOR LIVING FACILITIES

Some of the previous items can be evaluated for Senior Living facilities but as discovered during the COVID-19 response, the impact to the elderly can be catastrophic, particularly for populations that reside in closed quarters.

- Isolation Rooms and Positive Pressurized Rooms / Wards
 - Isolation for any infected population
 - Positive Pressure to protect immune suppressed or high risk
- Many residents may be high risk to disease, even if not immune suppressed. Residents could benefit from positive pressure in resident rooms
- Recirculation units with filtration capable of removing aerosol contaminants (PTAC units are not even MERV 1 rated filters)

- Do infected patients need a room like combination AII/PE to prevent other diseases or viruses such as influenza?
- Dining and Activity
 - Smaller more dispersed to minimize interactions
- Morgue/Holding
- Larger storage spaces for supplies
- Resident – Family/friends communication. Similar to a hospital patient room, what communication systems are in place if visitors can not enter the building.

For More Information Please Contact

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