

AUGUST 2020

## SPACE NEEDS, REDUCTION, AND RESTRUCTURING

### How can medical facilities restructure in response to this (and the next) pandemic?

Faced with an insurmountable burden due to the COVID-19 pandemic, healthcare systems have experienced an unprecedented impact to their bottom-line operating expenses and have stretched abilities to provide care to their patients.

The impacts were so significant that the American Health Association (AHA) reported that hospital systems have collectively lost over \$200 billion from March through May and are estimated to lose up to \$350 billion through the end of 2020.

During this time period, lost revenue from elective procedures, additional costs for staff training and overtime, and the costs of additional personal protective equipment (PPE) to protect staff have placed our health providers in a vulnerable spot.

HMC Architects has specialized in the planning and design of healthcare spaces for the last 80 years. Through the lens of research, we are exploring the pandemic as an opportunity to learn, reinvent, and most importantly help our clients amid this crisis, and their financial hardship.

As part of this ongoing research effort, we are committed to sharing our findings with the industry on five main areas of Technology, Adaptability and Flexibility, Regulatory/

Budgetary/Institutional Impacts, Space Needs, Reduction, and Restructuring, and Impacts to Wellness/Mental Health. In this article, we are discussing space needs, reduction, and restructuring as it relates to the healthcare sector.

#### WHAT WE HAVE VERSUS WHAT WE NEED

Many of today's hospital campuses have been decades in the making. Single-building facilities that were established to serve a community's healthcare needs have expanded to include multiple, interconnected buildings. Growing populations, changing regulations, and emerging technologies have led each campus with its existing buildings to take on a different character.

Forward-thinking organizations do their best to evaluate local and national healthcare trends to plan future facility needs. Yet few, if any, could have foreseen the seismic shift created by the COVID-19 pandemic. Facilities that were planned with an eye towards yesterday's future are now being examined under the lens of heightened infection prevention, social distancing, and flexibility of use.

While the long-term response to COVID-19 in the built environment will evolve as more is learned about the virus, we anticipate facility impacts will fall into three broad categories:



**Kaiser Permanente Downey Medical Center, HMC Architects**

- **Space Adjustments:** What spaces do we have in our current facilities that need to be modified in order to provide necessary precautions or accommodate different operational models?
- **Space Restructuring:** What spaces, departments, or units will we rethink and plan differently in response to the pandemic?
- **Space Reductions and Repurposing:** Which of our existing facilities will be found to be overbuilt due to a change in how people perceive healthcare in the future?

### SPACE ADJUSTMENTS

Not every space in our healthcare facilities will need to be redesigned and rebuilt in the wake of the pandemic. However, adjustments to our physical environment should be expected due to changes in social norms, facility operations, and infection prevention. Short-term impacts to facilities were largely quick space adjustments as organizations sought expedient solutions to COVID-19 surges in a safe environment. We anticipate that many of these short-term fixes will be codified and improved upon as facility planning progresses.

### Entry Points

The identification and segregation of infectious patients from the general population has been the first step to ensure a safe environment. Hospital systems have had to limit access to their facilities to evaluate patients before entering. This has included reducing the number of entry points, providing screening

and electronic temperature checks, and providing greeters to monitor the number of people entering and exiting.

New technologies have emerged and will continue to advance, enabling providers to electronically measure temperature as a first indicator of infections. This includes tools such as infrared cameras and hand-held devices to detect elevated temperatures at the door. As home health technology advances, temperature checks and screening by patients at home prior to their visit will be confirmed at the entry digitally via electronic health records.

To keep the facility as germ-free as possible, disinfectant mats at entry doors are being utilized to limit particulate entry to the facility. Entry doors are also being modified to provide touchless devices that control the doors. PPE and sanitizing stations are being provided outside the facility to ensure all entering have taken appropriate personal precautions.

It is likely that many facilities will use the reduction of entry points in the short-term to holistically rethink entry points. Patient and staff entries will likely split to limit cross-contamination. Discrete entries and circulation paths for known or suspected infectious patients will also be provided to limit the potential spread of a virus.

### Waiting Areas

Waiting spaces have long been thought of as a necessary requirement to hold patients before visits. Over the years, providers have



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explored operational strategies to minimize or eliminate waiting by use of technologies that call patients for appointments. Now, facilities are evaluating requirements for waiting spaces and the limitations for social distancing.

The first wave of changes included relatively simple adjustments to provide physical distancing and improved hygiene. These include:

- Adding screens between staff and patients at face-to-face interfaces.
- Providing signage and floor markers at 6-foot intervals to manage queues.
- Introducing touchless technology such as phones, apps, and QR code scanning for check-in.
- Increasing PPE, hand sanitizer, wipes, and mask stations at entries and waiting areas.
- Limiting the number of visitors that can accompany patients on their visit.

More drastic measures to reduce the amount of waiting indoors have also been employed. Facilities have encouraged patients to wait in their cars until they are called for their appointment. There have also been temporary surge tents set up outdoors to be used as waiting areas where weather permits.

Other facility changes added to these adjustments will reduce the number of people in waiting rooms and make them safer. Facilities will consider making all waiting areas and public spaces negative pressure or 100 percent exhaust, like emergency department waiting areas. Additional patient and visitor amenities will also be added to campuses to promote outdoor waiting.

Operationally, greater proliferation of self-rooming technology will provide for just-in-time arrival and reduction in group waiting. Appointment scheduling will be considered to separate known infectious patients from non-infectious patients by time rather than space. Touchless technologies that facilitate

check-in will also be further employed to limit in-person interactions.

In a 2016 survey, Deloitte found that patient-provider interactions ranked as the highest priority for patients, while digital health tools ranked lowest. While comfort with, and reliance on, digital health tools will increase over time, this survey underscores the importance of a positive personal physician experience. Organizations should be mindful that as strategies to limit contact between people are deployed, personalizing interactions inside and outside the facility should be prioritized.

#### **Nursing Units**

California's Office of Statewide Health Planning and Development (OSHPD) provided waivers for space use in hospitals, in effect from April 2020 thru April 2021. These waivers allow hospitals to increase hospital beds over the allowed amount by five percent. They also allow the ability to implement policies and procedures to accommodate multiple respiratory patients.

While the waivers have also granted hospitals the ability to reconfigure space as needed due to surge, they must restore the changes to their original configuration. Introduction of high efficiency particulate air (HEPA) filtration units in windows to change air quality and flow will eventually need a long-term solution. Likewise, the increase in storage on units to accommodate more PPE will need to be incorporated into planning.

Digital communication with patients to decrease the number of times nurses need to enter a patient's room will continue to advance as new technologies are implemented. The reduction in number and frequency of visitors to nursing units will also likely remain, as hospitals look to reduce risk of exposure for patients and increase campus security.

#### **Emergency Departments**

Emergency departments (EDs) can be challenging to affect wholesale change

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**Kaiser San Jose Skyport Medical Office Building, HMC Architects**

and remodeling given their 24/7 full-time use. Changes in the ED will be likely be focused on more modest physical changes and more robust operational changes.

According to reports published by the Centers for Disease Control and Prevention (CDC), the National Syndromic Surveillance Program found that ED visits declined 42 percent during the early onset of the COVID-19 pandemic. The report also found the proportion of infectious disease-related visits was four times higher during the same period. Most EDs have been designed to accommodate a modest number of infectious patients, but not a significant surge. An increased quantity of airborne isolation rooms can be expected in the future to segregate a portion of the ED as an “isolation wing.”

As access to virtual visits expands, hospitals may see an overall decrease of lower-acuity patients presenting at the ED but gain a better ability to segregate patients pre-arrival. Upon arrival, EDs will seek to create separate triage and waiting areas for patients with infectious disease symptoms and those without. Operationally, “pull-to-full” intake models will continue to become more frequent as a strategy to keep patients out of the waiting room altogether.

#### **SPACE RESTRUCTURING**

There are many departments within existing facilities that, due to existing infrastructure and complexity, will be very difficult to modify without significant renovation or replacement.

Yet, modifications will be required over time as organizations look to prepare for other similar infectious diseases.

#### **Medical Office Buildings**

Many medical office buildings (MOBs) saw their services suspended as healthcare organizations sought to limit the spread of COVID-19 and prepared for patient surges. Outpatient facilities have been used for COVID-19 treatment, testing, and other inpatient services under the Centers for Medicare and Medicaid Services (CMS) “Hospital without Walls” initiative. Due to the temporary closures, the industry experienced a significant shift to telehealth, with some facilities seeing an 80 percent shift during the height of the pandemic.

As these outpatient facilities now begin to reopen, they are implementing many of the space adjustments mentioned previously for entries and waiting areas. Implementation of touchless technologies, especially in the intake process, utilizing cell phone scanning, real-time location systems (RTLS), and “self-rooming” technologies will continue to expand. Workflow, scheduling, and provider accommodations throughout the normal business day will be critically explored as telehealth remains a viable alternative to in-person treatment.

The exponential increase in telehealth will also have a profound effect on MOBs. Redesign or refurbishment of typical exam rooms to flex between exam/treatment and telehealth will be



undertaken. The creation of telehealth “cubbies” to provide dedicated spaces for virtual care can also be expected.

While MOBAs are not as constrained by hospital regulations, stricter MEP requirements, and hours of use, they are challenging to adapt in place given hard wall construction and integration of services within those walls. New ambulatory care centers or significant renovations will be built in the future with the anticipation that inpatient overflow is possible. This would include providing access for temporary emergency power, access to medical gasses, larger rooms for stretcher-bound patients, and negative pressure isolation rooms.

### **Nursing Units**

Nursing units and patient rooms have traditionally been designed for a specific programmatic need or acuity level. For example, a medical-surgical patient room serves a specific segment of patients without the ability to convert to a higher-acuity use, such as intensive care unit (ICU) care. Further, they have been constrained by minimum room size, clearances, gas services, and air change needs.

The compartmentalization of units that limit size by function is a significant factor that limits future adaptability of existing units. However, increasing the number of isolation rooms within a unit, or taking full units and creating isolation wings, through modifications to heating, ventilation, and air conditioning (HVAC) systems will start to emerge. As new units are developed, acuity- and isolation-adaptable units will become more prevalent to handle surges of different patient types.

The reduction or elimination of on-floor waiting, and family areas will spur new programmatic requirements. Implementation of just-in-time notification systems will allow families to stay connected to care without being physically present. Public-facing accommodations at unit entries will also become more prevalent as interaction with visitors moves off the unit due to limited guests in the care area.

### **MEP Systems**

What the pandemic has revealed so far is that air quality and filtration, and negative pressure capable MEP systems are key to managing airborne diseases in hospitals. These systems must be evaluated for their ability to switch on and off based on specific health requirements.

The Hospital Building Safety Board (HBSB) is responsible for providing recommendations to OSHPD for potential code changes. In a June 2020 meeting titled: “Potential impacts to healthcare facility design,” guidance was provided by the board for recommendations about potential code changes related to MEP systems, including:

- UV-C treatment at coils and filters
- Change relative humidity levels from 40 to 60 percent in some areas
- Enhance filtration with MERV 13 or 14 as a starting point for design
- In-room HEPA filtration
- Evaluation of a minimum of six air changes per hour in a hospital
- Adjustment of some negative pressure rooms to add HEPA / exhaust ICU space
- Increased locations of low return exhaust grills
- Dedicated exhaust path for each toilet stall with an increase to 15/air changes per hour (ACH)

### **Hospital Campuses**

With the surge of COVID-19 patients arriving on site, and the desire to limit the number of people entering a healthcare facility, the entire hospital site has now become a potential site of care. What in the short-term materialized as pop-up tents used for outdoor triage and testing will become long-term preparedness plans in the future.

A higher degree of emergency planning will be needed to more seamlessly convert exterior spaces such as parking lots or parking garages into mobile care units and testing facilities. Redesigning permanent site circulation and running utilities to these future locations will be considered so mass



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conversion can occur quickly and seamlessly in the face of another pandemic.

Hospital campuses will also look at available land to identify permanent outdoor facilities that will continue to encourage people to remain outside the building. Changes to consider include additional short-term parking for quick appointment such as lab and pharmacy visits so patients do not have to access the full facility. Public amenities to promote outdoor waiting will also be considered to reduce the number of people utilizing waiting rooms in the future.

#### **SPACE REDUCTIONS AND REPURPOSING**

There has been a dramatic shift in how people view access to healthcare and the workplace in response to COVID-19. This shift will have a long-term impact to the regulatory environment, healthcare operations, and access to care. These changes in perspective will result in scenarios in which healthcare organizations find themselves with underutilized assets that will need to be repurposed to respond to the changing landscape.

#### **Medical Office Buildings**

As healthcare organizations have shifted their focus to preventative care versus reactive treatment, medical office buildings (MOBs) have been at the forefront of increasing access to care. With rising consumerism in the healthcare sector, MOBs have also represented a primary vehicle for healthcare systems to protect and grow their market share by placing facilities closer to communities. Considering the rise of telehealth during the COVID-19 pandemic, the demand for, and nature of new exam space, will need to be considered.

A recent study by McKinsey & Company explored the impact of telehealth post-pandemic and estimated that 33 percent of office visits and outpatient volume could be delivered virtually or “near-virtually.” Just because a visit can take place virtually does not mean it will; however, a study by The Commonwealth Fund found that, with little or no preparation, nearly 14 percent of all

ambulatory care visits were conducted via telehealth in the early parts of the pandemic.

Although that percentage has dropped as reopening occurs, it is anticipated that with regulatory changes, market incentives, and more consumer education, telehealth will remain a significant disruptor to outpatient care. At existing MOBs, the demand for in person visits will likely decline, especially in younger communities that have shown a greater interest in utilizing telehealth. Healthcare providers will need to develop strategic plans that predict a drop in demand for spaces at a ratio of 25 and 50 percent less volume over the next three years.

With higher acuity care moving to the outpatient setting, this excess capacity provides healthcare providers the opportunity to convert unused exam space to higher revenue-generating procedure space. Expansion of diagnostic services into vacated exam spaces can also provide a more inclusive “one-stop-shop” for patient convenience. The underutilized exam space could also be used to spur a greater number of specialties into the community to increase access to specialty care.

Conversion strategies will also be required to add flexibility to existing exam space that allows for the dual purpose of in-person exam and virtual visits. Different lighting, equipment, and acoustics are a few aspects that will need to be considered. Evaluating planning solutions that integrate work areas into bullpen configuration to further integrate care and reduce individual office needs is a strategy to maximize the efficient use of space as provider shift between in-person and virtual visits throughout the day.

The future of telemedicine is highly linked to the regulatory environment. On August 3, 2020, CMS issued proposed changes to the 2021 physician fee schedule that would make permanent nine new telehealth codes but extended several more only through the end of 2020. So, while the comprehensive outlook of telehealth is unknown, it is here to stay at a much higher rate than pre-pandemic levels.



**Kaiser Permanente Ontario Medical Center, HMC Architects**

### Offices

Well before COVID-19 was a household name, office space on healthcare campuses has been the focus of facilities seeking to maximize the revenue-generating use of costly hospital real estate. Many organizations have already relocated offices to the periphery of campuses, or off-campus altogether. At the same time, open-office concepts and shared workspaces have gained traction as a way for organizations to further reduce the square footage required per person.

Post-pandemic, it is expected that a significant amount of the non-clinical staff will be able to perform in a Work-from-Home (WFH) environment. This will reduce the number of administrative staff on campus and significantly reduce what has traditionally been “underperforming” space. A reduction in office needs on hospital campuses will allow the expansion of procedural and diagnostic space into the vacated areas but may also bring with it, environment of care upgrades to accommodate these uses.

When considered together, with the anticipation of underutilized exam space, it is possible that existing off-campus exam space can be converted to office space with modest space modifications, allowing providers even greater flexibility to shift between in-person and virtual care throughout the day.

### SUMMARY

There is still much to learn about the long-term impacts to social norms and healthcare

best-practices in a post-pandemic healthcare landscape. But one thing is certain: as healthcare operations and care protocols change, so will the buildings that house those activities. Being proactive in confronting facility constraints to providing a safe environment will be paramount to providing appropriate access to care in the face of a future pandemic.

### Short-Term

- The flexibility of nursing units to treat multiple acuity levels.
- Use of outpatient centers as COVID-19 treatment and testing facilities.
- Patient temperature and symptom screening upon arrival. This is sometimes done remotely via a QR code to scan at entry.
- The temporary conversion of Medical/ Surgical rooms for use as a COVID-19 ward.
- Providing portable high efficiency particulate air (HEPA) filtration units through a window to change air quality and flow.
- Increased use of PPE and storage needs on the floor.
- Increased signage identifying controlled risk areas.
- Major adjustments to MEP systems.
- Increased cleaning.
- Evaluate all high-risk surfaces which public and staff interface.

### Long-Term

- Demountable or permanent tent structures to triage patients outside.
- Additional airborne Isolation rooms.
- Air change requirements: humidity levels, air changes/hour, exhaust requirements.

- Greater focus and implementation of touchless technologies, especially in the intake process. This includes cell phone scanning, real-time location systems (RTLS), and “self-rooming” technologies.
- Touchless operational components.
- Changes in requirements for waiting, dining or other spaces which may be risks for infection transmission.
- Centralized management protocols for facilities to ensure pandemic compliant operations and cleaning and maintenance protocols across the enterprise.
- Patient and visitor temperature and symptom screening upon arrival.
- Hospital design will accommodate robotic deliveries, which requires path of travel consideration for clearances and charging.
- Ultraviolet (UV) lighting and new technologies will be incorporated into facility design.
- Continuation of high-percentage utilization of telehealth, requiring institutions to think critically about workflow, scheduling, and provider accommodations throughout the normal business day.
- Ambulatory care centers will be designed and constructed with the anticipation that inpatient use may be required in the future. This would include things like providing access for temporary emergency power, access to medical gasses, larger rooms to accommodate stretcher-bound patients, and the ability to provide negative pressure isolation rooms.
- Redesign or refurbishment of typical exam rooms to flex between exam/treatment and telehealth.
- A strong Information Technology (IT) backbone to support increased telehealth and other home-health solutions.
- Higher degree of acuity-flexibility planned for key rooms. For example, medical-surgical rooms designed to be ICU-capable or post-anesthesia care unit (PACU) rooms designed to be medical-surgical capable.

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