HMC Architects

HEALTH-CARE

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TECHNOLOGY

Will technology save our vulnerable health care system from 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 Restructuring, and Impact to Wellness/ Mental Health. In this article, we are discussing Technology as it relates to the healthcare sector.

TECHNOLOGY

Technology will be critical to all future operations and planning solutions—particularly for hospital safety. The identification and tracking of infectious patients is key to protecting others in healthcare facilities. Providers will use existing and new technologies to identify patients who show symptoms, to triage them before entering facilities, and track “at-risk” population groups to pre-emptively limit infection pools and future contagions.

Creating “touchless” environments has emerged as a key health and safety issue and current and new technologies will be employed that limit the human interface for contact with surfaces.

Telehealth will also continue to increase in use, as these connections to providers are more convenient and affordable than in-person visits.

In fact, there are few areas of healthcare that will not be touched by the expanding and improved technologies to create safe and effective interventional health spaces.

Kaiser Permanente Moreno Valley, HMC Architects

SAFE ENTRIES

The identification and segregation of infectious patients from the general patient population is 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 providing screening and electronic temperature checks at the front door. New technologies have emerged and will continue to advance that will enable 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. Below are the technology strategies we see advancing in the near and long term.

Short term:

- Evaluate the existing conditions of all entry points.
- Provide PPE for donning at building entry points.
- Provide screening and electronic temperature checks at the front door.
- Incorporate new technologies such as infrared cameras that detect infections.
- Provide rapid testing for viruses to identify infectious patients.

Long term:

- Evaluate which entrances can be used to limit access to the facility to test and triage patients before entry.
- Use of apps that will track and identify patients as part of entry screening.
- Evaluate an extension to the front door to add a portal that includes PPE equipment and handwashing stations.
- Consider negative pressure at these portal locations.

> Appointment check-ins will be further automated and will more closely resemble airline check-ins which are scheduled remotely, with notifications on updates.

Kaiser Permanente Moreno Valley, HMC Architects

WAITING ROOM DESIGN

The identification and segregation of infectious patients from the general patient population is the first step to ensure a safe environment. Hospital systems have had to evaluate the requirements for waiting spaces and the limitations for social distancing. Some facilities have provided temporary screening between patients to ensure separation and have added screens between receptionists to limit exposure.

Waiting spaces have long been thought of as a necessary requirement to hold patients before visits. But over the years, providers have looked for strategies to minimize—or even eliminate waiting—by use of technologies that call patients for appointments.

Similar to being paged at a restaurant when a table is ready, providers will employ technology that identifies a patient's location on campus and availability of rooms, and communicates when their appointment is ready. Appointment check-ins will be further automated and will more closely resemble airline check-ins which are scheduled remotely, with notifications and updates.

Short term:

- Evaluate waiting spaces to determine capacity at a reduced level reflecting a six-foot separation between patients.
- Provide germicidal stations that allow quick access for improved hygiene.
- Provide screening walls to separate reception staff from public waiting.
- Triage patients for infections before entering the facility to minimize risks for other patients.
- Consider staggering appointments of known infectious patients in the morning and non-infectious patients in the afternoon.
- Limit the number of visits or visitors based on reduced seating space.

Long term:

- Integrate "geofencing" technologies in coordination with hospital-based computer systems that locate patients on campus and provides the ability to connect with information based on their location.
- Develop strategies for "self-rooming" and "app-guided directions" so patients in clinics can arrive "just in time."
- Create spaces on campus with amenities for patients to wait outside the facility.
- Limit the number of visitors that accompany patients.

> Conversion strategizes will also be required to allow flexibility of exam and office use to meet unknown demand needs.

Kaiser Permanente Fullerton La Habra, HMC Architects

OFFICES AND EXAM ROOMS

The pandemic has created the need to evaluate the future demand for offices and exam rooms in the context of telehealth. According to a First Stop Health survey of midsize to large employers, 91 percent of them are expected to offer telemedicine in 2020. Demand among millennials will drive usage as 40 percent of this group said that telemedicine was “extremely or very important.”

With 83 million millennials making up the largest segment of today’s workforce, the demand for new office and exam space will be less and significantly impact the configurations and scope of medical office buildings. Conversion strategizes will also be required to allow flexibility of exam and office use to meet unknown demand needs.

Short term

- Evaluate the current demand for offices and exam rooms in the context of telemedicine usage.
- Consider the redesign of offices and exam space to support telehealth communication that assures acoustic privacy.
- Ensure lighting to convey friendly communication with patients.

Long term

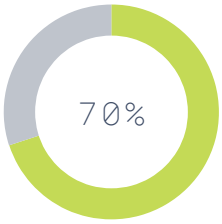
- Evaluate the drop-in demand and re-program office and exam spaces.
- Create smaller telehealth “cubbies” that are acoustically separated for virtual visits.
- Develop strategic plans that predict a drop-in demand for spaces at a ratio of 25 and 50 percent less volume over the next three years.

TELEHEALTH

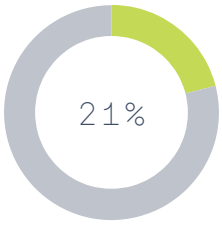
Telehealth visits have skyrocketed during this pandemic. Many facilities have been reluctant to go "all in" on providing these services due to the costs associated with the switch over, reluctance of physicians to adopt, and lack of reimbursement for visits by insurance providers or the federal government.

During the pandemic, the Center for Medicaid and Medicare (CMS) has relaxed payment rules allowing full payment for remote visits. Consequently, both providers and patients adopted to the new technology.

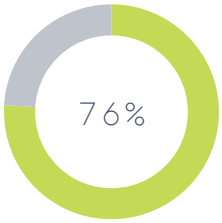
The benefits of creating a communication portal for patients to call or video can save substantial money for patients, allow quicker visits with no travel required, and provide health information on appointments, prescriptions, and medical records.



Consumers who say they would prefer to fill their primary prescriptions



Respondents who use telemedicine due to lack of travel time



Patients who prioritize access to a medical professional over seeing one in person

Our research indicates:

- 70 percent of reporting consumers say they would prefer to fill their primary prescriptions.
- Appointment times are, on average, 20 minutes or less.
- 21 percent of respondents use telemedicine due to lack of travel time.
- 95 percent of patients report being satisfied with their experience.
- 30 percent of patients are already using some sort of telemedicine services.
- 64 percent of Americans have expressed interest in using telemedicine.
- 7 percent (17 million) of Americans are willing to switch doctors due to issues with availability of telehealth appointments.
- 76 percent of patients prioritize access to a medical professional over seeing one in person.

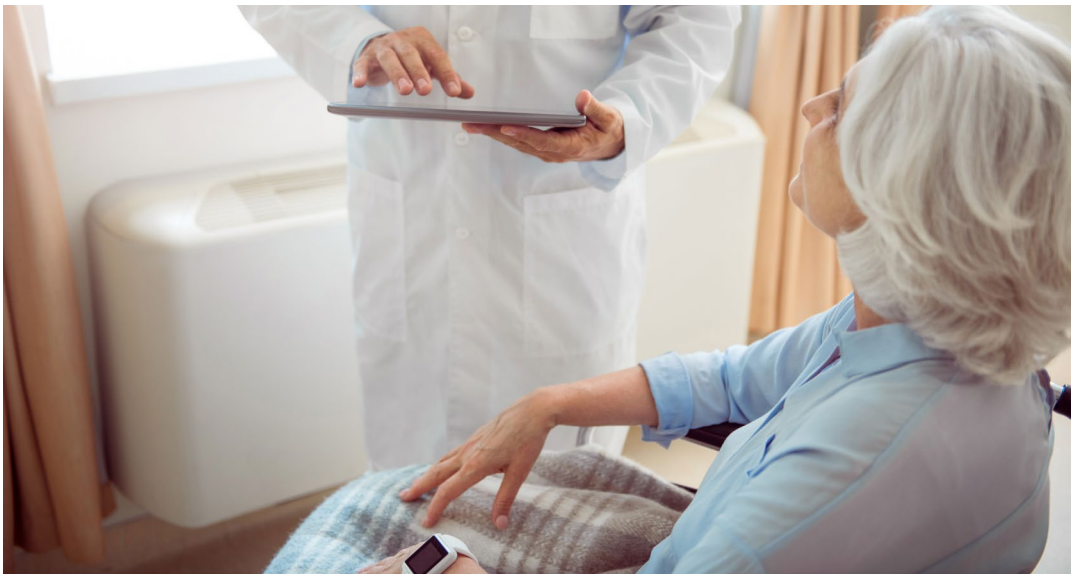
Short Term

- Evaluate the existing inventory of campus-wide exam and office spaces.
- Develop a plan for repurposing these spaces based on recent demand surveys.
- Evaluate cost savings of visits to offset losses.
- Consider the repurposing of offices and exam space to support telehealth communication that assures acoustic privacy.
- Ensure lighting to convey friendly communication with patients.

Long Term

- Anticipate Work from Home (WFH) staff workspaces and a reduction of the overall need for campus-based workspaces.
- Provide a telehealth playbook for patients to maximize their virtual experience.
- Evaluate the expansion of diagnostic services into vacated office and exam spaces.
- Evaluate planning solutions that integrate work areas into bullpen configuration to further integrate care and reduce individual office needs.
- Reconsider the exam room for multipurpose use to include telehealth needs.
- Connect patient personal wearable data to hospital based EMR system for more comprehensive patient analysis.

> Hospital systems will increasingly look to provide customized care in a home setting by utilizing navigators to identify most at-risk populations.



HOME HEALTH AND WEARABLE TECHNOLOGIES

If the pandemic has accelerated anything, it is the idea that we are all more connected by our health than ever before, and that we as a society are only as strong as the weakest link. We have exposed the vulnerabilities of our interconnectedness and the requirement for basic health for all. In this context it is important to evaluate vulnerable population subsets of the overall population to understand who is most at-risk and what will be the most effective way to keep societies safe.

Home healthcare is a natural extension to the migration of outpatient care and home health digital aids have become the tools for greater responsibility of one's own health and to share health data to providers. Wearable health devices and their abilities to connect with hospital-based records will have an increasingly dramatic and important role on how, where, and who provides healthcare.

Hospital systems will increasingly look to provide customized care in a home setting by utilizing "navigators" to identify most at-risk populations. It is estimated that about 20 percent of the overall population consumes 80 percent of the healthcare dollars.

Health inequality affects the entire population as distrust in health systems, lack of access, and rising costs have exposed not only the elderly but families and young adults—particularly those of color.

At-risk populations with underlying conditions in depressed social economic conditions will need to take greater responsibility for self-care which can be aided by wearable devices with assistance from community-based health navigators.

Short Term

- Evaluate those segments of the population most at risk for health issues.
- Develop an information/public relations strategy to provide information and education.
- Coordinate with community groups and key stakeholders to overcome language and access barriers.
- Provide testing to identify population-based maladies.

Long Term

- Partner with technology firms (such as Apple or Google) that are investing heavily in products and research.
- Implement a long-term community-based strategy to improve health.
- Campaign and champion improved health around: food awareness, mental health, and personal responsibility.

> Hospitals and clinics are quickly evaluating opportunities for a touchless environment that limit exposure and risks.

TOUCHLESS ENVIRONMENTS

The pandemic has created a lot of anxiety among patients who are reluctant to visit hospitals fearful that they will pick up a germ or virus and that hospitals are not safe. The perception that hospitals are incubators for diseases and microbes requires hospitals to not only double their efforts on cleaning and sterilization, but to limit the human interface on touching surfaces. Hospitals and clinics are quickly evaluating opportunities for a touchless environment that limits exposure and risks. Areas that are considered “high touch” are door handles, kiosks, elevator control buttons, and bathroom and toilet fixtures.

Short Term

- Increased cleaning.
- Evaluate all high-risk surfaces with which public and staff interface.
- Provide signage within the facility to inform of risks.
- Partner with vendors and manufacturers to evaluate mitigation strategies to limit touch.
- Consider door handles and control points to be card operated.

Long Term

- Configure the environment to minimize touch points.
- Evaluate the most at risk surfaces for new solutions.
- Consider “holographic” interfaces with control buttons.
- Utilize “germ free” surface technologies that limit life of microbes.
- Implement card reader access controls.

> Ultraviolet (UV) cleaning can be performed by robots in a room or mounted on the ceiling and will continue to be used going forward.

Narrow spectrum lighting for infection control, Henderson Hospital, Henderson, Nev.

ROBOTICS AND LOGISTICS

As we have seen with the current pandemic, access to PPE and having up-to-date information on where equipment is located is critically important. What has been further exposed is that there has not been a coordinated response on a regional, state, and federal level on procuring and storing supplies to meet the surge of patients. The need for surge planning is an important effort to combat unforeseen demands on the healthcare system.

Transportation and delivery methods of both supplies and people will continue to evolve and accelerate the developments of technology. Dramatic shifts have already played out in recent years for the movement of people coming to a facility. This includes use of rideshare companies, which have changed patterns of driving and demand for parking and will continue to test urban planning.

Robotic deliveries of supplies for food, pharmaceuticals, lab results, supplies and equipment have played a backseat role the past 20 years, but the acceleration of these technologies will further change the physical nature of spaces. Ultraviolet (UV) cleaning can be performed by robots in a room or mounted on the ceiling and will continue to be used going forward.

Short Term

- Survey patients and staff to determine methods of travel to the facility to examine future impacts to drop off, pick up, and parking.
- Evaluate robotic delivery strategies and new efficiencies for just-in-time deliveries.
- Install current technologies to deep clean facilities by use of UV lighting.

Long Term

- Rideshare services require a new planning interface for the front door, emergency rooms, and parking
- Hospital design will accommodate robotic deliveries, which requires path of travel consideration for clearances and charging,
- UV lighting and new technologies will be incorporated into facility design.

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