CHALLENGING FUTURE DESIGN:

Predictions on Healthcare Design in the Aftermath of the COVID-19 Pandemic

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Terry Thurston, RN, MBA, **brings her experience as a former chief nursing officer, system quality director, and director of planning for BSA LifeStructures to bring a multi-faceted approach to designing safe and efficient healthcare facilities.**

February 2020: Healthcare was busy planning and designing creative evidence-based design healthcare environments with retail-like amenities. Fast forward to April 2020, and many of those projects are now on hold while innovation is occurring with the creation of field hospitals in parks and conversion of convention centers to hospital beds. On the east and west coast, US Navy hospital ships have stood ready to care for hospital overflow patients. We have seen red tape slashed for burdensome hospital rules in this disaster to save lives. This crisis will be over; however, health experts predict potential mutations and recurring seasonal COVID-19 disease concurrent with influenza.

We have known that since the 1918 Influenza pandemic and most recently SARS and Ebola that the "next thing" was around the corner; however, we were not prepared. We must learn from this experience the lessons of proactive preparedness. Human-made and other natural disasters such as tornadoes, floods, and hurricanes will continue to rely upon the healthcare system to accept patients even in the face of epidemics and pandemics.

We should not sacrifice the significant advances in healthcare design over the past several years, especially considering the years it took to make the private room a requirement. Healing environments with natural light have research to prove their effectiveness in recovery for both patients and staff.

We know that our world as we knew it will be forever changed due to this pandemic and that advances in technology and creative thinking will be the way forward. Healthcare design and operations are no exception. What will we learn from the frontline nurses, providers, scientists, and patients? The application from these learnings will make all of our healthcare environments better prepared to care for our caregivers and patients in all circumstances.

Over the years, I have written about and participated in numerous projects that explored new paradigms and innovations to improve the patient and caregiver experience through intentional functional design. Many of those innovations have been implemented successfully, and some have struggled operationally. All cards are on the table now as we think about healthcare strategy and design. Just as scientists are working day and night to develop vaccines and cures, architects, engineers, and operational planners must walk beside and in front of them with inventions and innovations to continually improve the built environment.

This article shares my top of mind predictions and suggestions relative to the healthcare design landscape of the future. Most of these ideas are not new, but we must have enough courage to challenge the design status quo and plan for a design that is flexible and adaptable.

A New Face for Ambulatory Care

Telehealth: I have long predicted that once telehealth could be reimbursed, office visits would go down. To wit, my healthcare system has converted all non-urgent exam visits to virtual visits during this pandemic. Apps are easily downloaded and work well for consultation and visual assessments. Telestroke and Telepsych have been successfully implemented in remote and community emergency departments for several years. More importantly, providers will be reimbursed for the visits, and patients will have improved access to care.

We need to consider the impact of telehealth before building more exam rooms. The utilization rates for exam rooms in medical office buildings in both academic and private practice settings are oftentimes 60% or less during hours of operation.

Consider the patient and provider in a rural clinic or long term care facility who can have a comprehensive medical assessment from a specialist in another city. Requirements for advanced telehealth exams will have lighting, sound, equipment placement, etc. and may be done in an existing exam room or dedicated telehealth room depending upon the specialty. We must take precautions to make sure that as more providers work from home and other remote places that cybersecurity, patient privacy, and HIPPA requirements are not breached.

Urgent Care Centers and Freestanding Emergency Departments: These will likely be more top of mind

choice than visiting an emergency department for the walking wounded. Today, we are seeing patients avoid trips to the hospital emergency department with severe illnesses such as heart attacks and strokes due to fear of getting infected, resulting in more deaths at home. Meanwhile, many emergency departments still have the capacity and are showing decreased volumes during this pandemic.

Ambulatory Surgery Centers: These centers need to gear up for increased volume to face the backlog of delayed elective surgical procedures. They should also plan for post-op bed capacity to serve as overflow for hospitals in preparation for potential new regulations that allow for a longer length of stay than 24 hours.

Immediate Rooming for clinic exam rooms: In this model, the patient checks in via a kiosk or in person with a navigator and is escorted personally or directionally to an assigned exam room. This can be a design model, OR it can be operational in any design. The early version of this design required an extra corridor for the patient to come in one door and the provider to come in from a central work core. This two door design typically requires more square footage, which increases construction and operation costs. We have learned with COVID-19 that this can be implemented in any configuration with tight operational controls around scheduling, appointment reminders, and intelligent clinical information systems. The idea of having the patient wait in their car and be texted or called until their exam room is ready is just one example of a no-cost innovation.

Recommendations for Ambulatory Care

1. Future designs should have significantly less waiting space and more immediate rooming from arrival to the exam room. While some waiting may be required, the area should be designed to isolate potentially infected patients in pods or cubicles from those who are there for well or preventative visits. The area should allow for protection of droplet and airborne transmission with 6 feet of distancing between seating.

2. Provide space for providers to perform telehealth assessments and consultations, which may be done in existing examination rooms.

3. Plan operations to reduce waiting space by avoiding double and triple booking patients at the same time.

4. Plan paths of travel and entry and egress areas to minimize cross-contamination.

5. Provide more handwashing sinks throughout the building, e.g., at entry, check-in, and egress of the building.

6. Consider negative pressure isolation rooms in outpatient clinics and direct all airflow to outside.

The New "Hospital" of the Future

Imagine that all hospital rooms are designed with the potential to be critical care capable. Some in the medical profession have hypothesized that future hospitals will primarily be critical care hospitals with a universal room design (all patient rooms designed to care for ICU patients).

The *universal room* concept was developed in the 1990s, and many models have been successful, especially in specialty units such as cardiac care. The universal room model was initially intended to keep the patient in the same room throughout their hospital stay; thus, the care team works around the patient rather than the patient working around the hospital design and avoids being transferred to another unit. The operational model for the universal room is called *acuity adaptable*. This model has struggled for a variety of reasons due to the cost of building all universal rooms. While the room may be universal, all nurses and providers are not universal and are highly sub-specialized. Today when hospital projects are planned, the majority of hospitals continue to choose to have traditional intensive care units and lower acuity medical-surgical units for patients of lower acuity.

The question always arises: What percentage of ICU (universal) rooms do you need? The ICU room has increased requirements for size, medical gasses, and support space, which significantly impacts budgets. I believe that we need to be prepared with more universal or ICU rooms in the future. However, we should challenge ourselves to be creative by providing infrastructure that is flexible to timely convert the med-surg room to accommodate sicker patients by providing additional medical gasses if higher acuity care is needed, i.e., ventilators. The med-surg room should also have increased visibility from corridor workstations similar to ICU rooms. Air exchanges in patient care rooms should be negative to provide an exchange of outside air to better respond to disasters such as we are facing today. If they can do this on the USN Comfort Hospital Ship, we should be able to do it in our hospitals.

As hospitals focus on the critically ill, they may become smaller, and there may be a rise in more specialty hospitals with anticipated growth in orthopedics and spine, cancer, and mental health. Historical and population health metrics are a factor in how many beds are needed. Academic health system planning and large hospital systems might consider a master plan that allows for the critical care hospital or unit to be immediately connected to these specialty hospitals to allow for safe and efficient care of the patient throughout their stay. This would avoid duplication of necessary resources and services. It would also increase patient safety by having the right resources at the right time in the right place in the event of an emergency. Imagine a hospital "village" with critical care at the core so that it is immediately available and accessible in a hub and spoke system.

Public spaces may shrink or change completely. Lobbies with excess seating and pianos and other social gathering places will be a thing of the past. Dining spaces will need to provide appropriate spacial distancing through creative seating arrangements.

Access points to all healthcare facilities need to have secure monitoring systems and provisions in place to identify the potentially infectious disease patient upon arrival and to isolate them. The minimum standards for decontamination in each hospital are no longer sufficient. Some hospitals, such as Skane's University Hospital in Sweden, have direct access for emergency patients to isolation rooms from the outside.

Recommendations for All Healthcare Environments

1. **Technology Innovations:** Imagine a healthcare environment with more touch-less and voice-activated controls of elevator buttons, doors, faucets, toilets with automatic lid closures, and other common surfaces. We know that physicians and nurses are burdened and often burned out by the excessive documentation requirements. We need to advocate for better voice-activated systems to support that documentation. The possibilities are limitless. Just ask Siri.

   Imagine how virtual electronic ICUs, similar to air traffic control in airports, could provide more monitoring and assessment with remote credentialed physicians and nurses to supplement, not replace, the bedside caregivers knowing that there are skilled professionals on their team virtually 24/7. Virtual ICUs have been around for decades, so has the healthcare system been shocked enough to consider this as a best practice?

2. **Supplies:** For years, I have seen hospitals waste precious time and money in endless hours of meetings while studying whether to have "nurse-servers" or supplies and medications at bedside that pass through from the corridor to the patient room. Like the universal room, this concept has been around for decades, yet many hospitals struggle to manage it safely and efficiently. There is always a push-pull for nurse efficiency to have supplies at the right place at the right time. As a former bedside nurse, I have always advocated for this and still do. Now I lean to the infection prevention supply contamination lessons learned and administrators who care about waste from discarding supplies that may have been contaminated in the patient room with pass-through systems.

   Supply cabinets, including PPE, should be immediately accessible from the corridor side of the room for retrieval upon entering the room yet protected from contamination. Medications will likely be in dedicated medication rooms, which should not be more than 50 feet from the most distant room to avoid excessive nurse walking distances.

3. **Staff Support Areas:** Staff lounges and respite areas are often a priority in planning, but as space gets squeezed due to budgets, they often become an afterthought and are reduced in size. The staff support areas should have enough seating that allows respite and spatial distancing. Showers should be provided in each area for staff decontamination during their shift and prior to going home. Consider balconies so that staff can have fresh air and natural light to provide mental breaks from their stressful and emotional work.

4. **Eliminate or redesign public gathering spaces including waiting rooms:** As above, lobbies will be reduced or eliminated. There will always be a need for waiting for families, so consider cubicle or pod waiting areas in surgical waiting and emergency department waiting rooms. Family and loved ones may need to be limited in the number of support persons who accompany the patient. In emergency departments, staff should have visibility directly or with cameras to monitor patient and visitor activity to waiting areas.

5. **Limit and control access points with secure monitoring.** Visitors and guests should be registered and be provided with identification badges. Patients and staff are vulnerable to not just disease but violence. We need to be holistic in safe design implementation and not take our eye off the ball of the multiple threats that are posed to our healthcare environments.

Finally and yet equally important, federal and state regulatory agencies, as well as design guidelines, need to support and not hinder the progressive urgent needs of the healthcare system. There is inconsistency among professional organizations and adoption of design guidelines among states. Many regulations are archaic and add expense to the already burdened healthcare budgets. CMS and other state and local regulatory bodies have stepped up to the plate and shown that this can happen in a disaster such as the COVID-19 pandemic, and I encourage them to keep that momentum going when we return to "new normal" times.

Most of these ideas are not new, and some are controversial. It is time to rally around the substantial research, learn from our after-action debriefs, and to create new models for healthcare design.

I invite you to offer your opinions and suggestions for how we can make the healthcare built environment a safer place for patients and their caregivers.

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