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Is There an Environment in Virtual Care? (2397)

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I was recently asked to speak at the Swiss Center for Design and Health (SCDH) 2024 Symposium, where the topic was "Building Trust: Designing for Remote Care." The July event was scheduled well in advance of The Joint Commission's (TJC) July 1 launch of the Telehealth Accreditation program (TJC, 2024) and the Facility Guidelines Institute's (FGI) July 1 opening of the public comment period for the development of the 2026 *FGI Facility Code* (FGI, 2024b). Separately, all three organizations were simultaneously touching on the evolution of telemedicine and remote care in different ways. The question arises—is it the technology? Or is there an environment in virtual care?

Virtual Care: An Evolution

While we tend to think of virtual care as a new phenomenon, in fact, the concept was envisioned a century ago as illustrated on a 1924 cover of the now defunct Radio News (Figure 1). In this early rendition, we can see a speaker, camera, screen, printout, and peripherals—most of the components of today's virtual care.

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Virtual care has been made possible through development of technologies dating back to the telegraph (first message 1844), the telephone (first call 1876), and the transmission of visual images by wire (first demonstration 1914). Through these early technological innovations, people were able to transmit heart rhythms, order medical supplies, communicate health status, and give remote medical advice. Virtual care was further advanced in the 1960 through closed circuit TV and microwave audio–video treatment of patients. This evolved into a concept of individualized healthcare consultation through remote means.

Tele-: Medicine, Health, and Presence

There are many definitions for telemedicine and telehealth, and the terms are sometimes used interchangeably. One study found more than

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Figure 1. Radio news cover from 1924 envisioning virtual care.

100 definitions in peer-reviewed journals with a general consensus that telemedicine refers to remote clinical encounters, while telehealth is a larger umbrella term (Shaver, 2022). In an even larger context, the American Telemedicine Association (ATA) Human Factors Special Interest Group (SIG), in collaboration with the Home Telehealth and Remote Monitoring SIG, stated that telepresence (independent of the clinical content of the encounter) "encompasses the demeanor of the participants as well as the quality of the encounter involving lighting, sound/noise, and room appearance—in short, most everything that the technology of the video/audio connection can convey" (Krupinski & Leistner, 2017, p. 1).

The Rise of Telemedicine

The ATA was formed in 1993, and while we tend to think of the explosion in telemedicine as taking place during the COVID-19 pandemic with regulatory relaxation, the growth of telemedicine was already well underway. For example, by 2016, 61% of healthcare institutions were using telemedicine in some form (Office of Health Policy & Office of the Assistant Secretary for Planning and Evaluation [ASPE], 2016). From 2014 to 2018, provider-to-patient telehealth (nonhospital related) grew 1,393%, although this only accounted for 0.104% of all medical claim lines (FAIR Health, 2019). Between March 2019 and March 2020, however, there was a 4,347% increase in national claim lines for telehealth compared to all medical services, further increasing to 8,336% when comparing April to April of each year (FAIR Health, 2022). According to FAIR health (2022), telehealth claim lines accounted for 9.3% of claim lines by January 2021.

The Decline in Telemedicine

Since the end of the COVID-19 pandemic, use of telemedicine has been declining. FAIR Health has reported medical claim lines via telehealth were down to 4.9% in April 2024, lower than during the pandemic, but still significantly higher than prepandemic levels. Additionally, an annual summary of Part B Medicare telehealth indicates use was 48% at the end of 2020, dropping to 34% by the end of 2021, 29% in 2022, and most recently, down to 25% by the end of the year in 2023. In April 2024, mental health conditions (e.g., anxiety disorder, major depression, adjustment disorder, attention deficit/hyperactivity disorder, post-traumatic stress disorder) were ranked as the top diagnostic category (FAIR Health, 2024). Interestingly, the first review of tele-mental health services was published more than two decades ago (Hilty et al., 2003).

Just like in-person care, remote care is a complex system that includes organizational policies and procedures, people (providers, patients, and even families), and the environment—both the local built environment and the external regulatory environment. The challenge is perhaps best stated by Perry et al. (2021), "Very few workers within healthcare have experienced system design; they simply react and adapt to a system they were handed." According to executive

leadership at Stanford, the decline of telemedicine use "represents our collective failure to break free from traditional ways of working" (Entwistle & Sharp, 2024). With telemedicine, we are trying to adapt digital technology to an analogue paradigm rather than thinking about system design.

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Diverse Interests in Telemedicine Applications

I thinking about systems, there are many considerations to take into account, and it is interesting to review the perspectives of three organizations that are considering regulations and guidance, as well as design and operations.

Facility Guidelines Institute and Telemedicine

The FGI *Guidelines* documents are developed on a 4-year cycle (i.e., the 2018 edition was developed and approved from 2015 to 2018). I had the opportunity to lead FGI's Health Guidelines Revisions Committee (HGRC) task group that developed a telemedicine section for the 2018 edition of the FGI *Guidelines for Design and Construction* documents for hospitals and outpatient facilities. When the task group began reviewing evidence for minimum built environment standards in 2015, there were animated discussions about the role of the environment versus the capability of technology. Some argued that telemedicine was only about the capabilities of the technology, while others pointed to research that suggested space, lighting, and acoustics could all be facilitators or barriers to remote care.

Through a process of consensus, the task group developed language to submit as minimum requirement and guidance proposals for the 2018 cycle. The HGRC accepted the premise of minimum standards for the built environment (with some modifications) and the text was put forward for public comment. Following the public comment and HGRC voting period, the standards were included in the 2018 Guidelines. A glossary definition and clarifying language were included to establish the intent for the minimum requirements. The definition, "the use of electronic communications for the exchange of medical information from one site to another" was clarified for when requirements applied "where clinical telemedicine services are provided in a healthcare setting," not visits that originate from a home (FGI, 2022, pp. xivii, 93–94). Further changes to the language were made during the 2022 cycle (2019–2022), and minimum requirements include the following:

1. A room for telemedicine services (that can be used for other functions) with space for an exam table within view of the camera, fixed or mobile telemedicine equipment, peripheral devices, an onsite caregiver or presenter, a handwashing station where a hands-on examination is provided, and a documentation area;
2. Visual and auditory privacy;
3. Acoustic requirements for speech intelligibility, sound isolation, background noise, and speech privacy;
4. Lighting and glare control;
5. Interior surfaces to maintain natural rendition of color and a background reflectance of 30% to 40%;
6. Site identification, unless embedded into the telemedicine platform; and
7. Support areas for portable equipment and devices.

Additional guidance was established as appendix language (i.e., not a minimum requirement) and included considerations for sizing to account for cameras and microphones, noise sources, lighting color and levels, and means to control of glare. A resulting white paper (Taylor, 2020) outlined and expanded on the research that was reviewed for the 2018 Guidelines cycle.

In the 2026 cycle (commencing in 2023), a proposal was put forward to delete all the minimum requirements for telemedicine in the FGI hospital document. The substantiation included comments that the technology, reimbursement, and practice of telemedicine is moving faster than our ability to regulate it, and

that the requirements did not represent a reasonable minimum standard. When the 2026 draft FGI *Facility Code* document was posted for comment in July 2024, the draft text reflected that the proposal had largely been accepted, with the remaining text reading, "Where telemedicine services are provided, spaces shall be designed for acoustical and visual privacy" (FGI, 2024a). The text will likely be revised during the comment and voting period. With FGI's newly announced code approach, previously included appendix material (advisory guidance) will be placed in the proposed series of handbooks to be released concurrently with the *2026 FGI Facility Code* (FGI, 2024b). As such, there may still be an opportunity for subject-matter experts to incorporate the 2022 minimum requirements (in some form) for guidance during design. My mind returns to the question of 2015—what is the role of the built environment in virtual care?

The Joint Commission and Telemedicine

There are also standards for delivering virtual care established by TJC. As TJC is largely focused on operations, not design, the conditions of participation for telemedicine in the 2021 Comprehensive Accreditation Manual for Hospitals outlined licensure and credentialing issues for originating and distant sites (TJC, 2021). Typically, TJC Environment of Care requirements address risk (i.e., safety and security, hazardous materials and waster, fire safety, medical equipment where use can result in serious injury or death, utility systems), but there are also standards related to space—the quality of natural and artificial light, privacy, size and configuration of space, security for patients and their belongings, clear access to internal and external doors, level of noise, and space that allows staff to work efficiently. While not specific to telemedicine, the elements of performance reference lighting suitable for care, treatment, and services, and further references direct to the 2018 FGI *Guidelines*.

Earlier in 2024, TJC announced the inception of a new accreditation for telemedicine (TEL). In launching the TEL accreditation, TJC is not addressing organizations that are offering telehealth in addition to in-person care for their own patients (part of an integrated omni-channel approach) but "organizations that are 100% telehealth and do not have any physical interaction with patients" (George et al., 2024). In the webinar posted by TJC, George et al. explained that traditional standards for the environment of care or physical setting were not needed as there are no patients in these brick-and-mortar facilities. There are, however, care providers, who are subject to the conditions of the environment where they work, and these conditions can influence the virtual interaction. Absent being able to review the new requirements (not received by the time of this writing), it is unclear what remains as part of "other requirements" (e.g., equipment, devices, and connectivity) in the program. Again, I find myself asking about the role of the built environment in virtual care.

Swiss Center for Design and Health and Remote Care

Whereas FGI and TJC focus on regulatory requirements for telemedicine, the SCDH 2024 Symposium was intended to explore the impact of digital transformation on healthcare design. Dr. Nirit Pilosof, the first keynote speaker (and one of the symposium organizers), primed the audience to think about the intersection of technology, space (the built environment), and the human experience. In the second keynote, Dr. Paola Pierri prompted attendees to think about the digital divide and equity issues in remote care services. She further challenged the traditional notion of home, which may not be the same for many disadvantaged populations. My presentation focused on the issues of physical space described above. The connecting theme of the presentations was how the design of remote care could build trust between users and enhance the quality of care.

In a subsequent working session, four simulations were conducted in mockup spaces. The scenarios were used to brainstorm and investigate the implications of remote care in both the hospital

and home setting. Simulations included a postoperative discharge, in-hospital surgical decision making, management of heart disease in the home, and an adolescent telepsychiatry consultation. The process was inspired by the simulation-based hospital design testing (Colman et al., 2019, 2020) and was used to help unite the relationships of the human interaction, the technology, and the space. While I will let the event organizers disseminate the results, the same question came to mind—how much of the service is helped or hindered by the design of space?

All Care Takes Place in a Place

We can easily conceptualize telemedicine as the visit with a primary care physician or physician's assistant through a web-based portal while we're using our laptop or smartphone. We may think about the technology and the quality of the connection—both are important components of the experience. The reality is that even the most basic "virtual" encounter happens in a physical space, and in some instances, that space may be detrimental to care. Researchers have reported on the porosity of place in virtual care (as compared to the protected confines of an exam room) that has included supermarkets, public transportation, cars, and even office toilets (Moore et al., 2024). Moore et al. comment that while the convenience and flexibility of virtual care can be an asset, it may come at the expense of safety and confidentiality.

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During the COVID-19 lockdowns, many professionals invested in ring lights, in "styled" settings (real or virtual), and in rooms (often closets) with doors to cut down on noise, distractions, and interruptions. A good video setup has been called the new business suit (Karl et al., 2022), and research suggests what we see on screen influences impression formation (Fauville et al., 2022), perceptions of trust and competence (Cook et al., 2023), engagement (Gordon et al., 2020), and even mental state (Tam et al., 2007). Functioning virtually became personal for most of us during the pandemic, so it is surprising that we do not invest the same level of thought in virtual healthcare.

In a recent systematic literature review for smart waiting rooms, 10 researchers investigated the role of the Internet of things (IoT) and telehealth in clinical waiting rooms (Spoladore et al., 2024). In exploring the current solutions for smart waiting rooms, the authors found many references to technology but few, if any, references to the built environment. The team proposed a solution that leverages multiple forms of technology (i.e., virtual reality artificial intelligence, and IoT devices) to support the diagnostic process, personalize the patient experience, and account for features of the physical environment. While such novel proposals may suggest we are at the edges of new thinking about remote care, digital technologies, and system redesign, we still have a long way to go. While people may struggle with the built environment as a modifiable variable in remote care, as architects and designers we need to be proactive in designing spaces for virtual care, wherever they are, to advance past the "react and adapt" mentality. Place still matters and I would challenge us all to be more diligent and intentional in our thinking about the intersection of technology, people, and the physical environment of care, wherever it happens.

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