Evidence-Based Design: Structuring Patient- and Family-Centered ICU Care
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Three decades ago, the Picker Institute set forth recommendations about how to include patients and families in care delivery [1]. Since then, patients' loved ones are increasingly recognized as vital to patients' healing processes, particularly during hospitalizations for acute and life-threatening conditions. In a typical adult intensive care unit (ICU), a priority is to protect patients from infections and stress. Restricting visitor access also protects staff space and privacy, enabling staff to focus on the hour-to-hour needs of patients. While this model has some important benefits, it also has some drawbacks that patient- and family-centered care (PFCC) models address. Specifically, PFCC replaces a hierarchical, clinician-centered model by treating patients' loved ones as partners in healing rather than visitors. Patient's family members, once restricted to 10-minute visits with patients every few hours, are now invited to be present continually—in some cases during rounds and shift changes. Significant cautions about and barriers to adoption of PFCC models of ICU care, however, need close attention and are considered in the rest of this article. But first, what are some of the important benefits of PFCC?

Benefits of PFCC Models of ICU Care
An ICU that invites family presence and participation fulfills many important social, emotional, and informational needs of patients' family members [2, 3]. According to a report from the American Association of Critical-Care Nurses, when family members are allowed to bear witness to lifesaving procedures and day-to-day care, they have less anxiety and greater confidence that everything is being done for their loved ones [4]. Likewise, when patients are unable to speak for themselves, family members often step in as surrogate decision makers, which can greatly influence clinical outcomes [5]. Ongoing communication of important information, such as medication history and changes in patients' conditions, can play a key role in safe and effective care delivery [6]. Family members are also invited to share personal narratives that ensure their loved ones' needs, values, preferences, and beliefs are incorporated into care plans [7].

Cautions about Implementing PFCC Models of ICU Care
Given the benefits just described, why would organizations hesitate to adopt and integrate PFCC models and practices? In some respects, PFCC may be easier to deliver in theory than in practice. A review of several decades of nursing literature shows that family presence in ICUs has always presented challenges for nursing staff. Increased family presence—around the clock, in some cases—requires clinicians to encounter

more people and to navigate a confluence of interpersonal, social, and cultural dynamics at the patient's bedside. Trying to determine the right tone or degree of transparency in delivering information to an anxious family can be a delicate balancing act, especially for new nurses [8]. Moreover, each family member handles stress differently. Being on the receiving end of some members' dysfunctional ways of coping with a loved one's illness or injury can increase stress among staff [9]. Nurses' experiences suggest how clinicians are expected to attend to the needs of many stakeholders other than the patient. At times, boundaries must be placed and affirmed when family members' needs compete with those of patients—for example, when a sick patient needs to rest while a family seeks reassurance at the bedside [10]. Some nurses have argued that the sickest patients (e.g., those with neurological or coronary conditions) need additional safeguarding, even from loved ones' good intentions [11]. So, resisting implementation of PFCC models that prioritize the needs of patients' loved ones can, in some cases, be an important way of protecting patients' best clinical interests.

Physical Barriers to Implementing PFCC Models of ICU Care
The physical layout and design of ICU space can also pose significant barriers to integrating PFCC. Studies have shown, for example, that when nurses consider patient rooms small and uncomfortable, family presence is discouraged [12]. Clinician-centered design prioritizes staff and patient privacy, whereas evidence-based design (EBD) supports integrating clinical tasks with safety and transparency. A growing body of research suggests that good design can help reduce infections, decrease stress, shorten length of stay, and facilitate other positive health outcomes [13]. Strategically placed sinks that encourage hand washing, decentralized nursing stations with direct visibility to patients for improved safety, and sunlit rooms with views of nature to relieve stress are just a few EBD recommendations set forth by industry experts [14].

Likewise, design can play an important role in facilitating PFCC. Key principles of PFCC, including greater communication and collaboration, are facilitated by how the ICU environment is structured. Physical elements such as glass instead of solid walls, larger patient rooms with wider berths around bedsides, and private meeting spaces are EBD changes that can make PFCC more likely to be a natural part of everyday life in the ICU. In one study, for instance, family presence at the bedside increased when rooms provided comfortable seating [15]. A study I conducted with my colleagues showed that nurses working in renovated, family-centered neurological ICUs found these environments more conducive to PFCC than clinician-centered models and that they facilitated more efficient informed consent processes [16].

Conversely, our study also found that these same spatial qualities of co-visibility and proximity between staff and family increased potential for clinicians being interrupted at their workstations and exacerbated clinicians' self-consciousness about being watched [16]. The PFCC model requires clinicians to relinquish some workplace privacy and

control otherwise afforded by clinician-centered environments. Our study demonstrated that this loss of privacy and control may contribute to high levels of clinician stress without organizational resources and support to facilitate the transition to this new care environment. These findings illustrate that switching from a clinician-centered model to a PFCC model requires organizations and clinicians to trade the benefits of one model for the benefits of the other.

Today, architects are challenged with designing ICUs that simultaneously nurture clinicians' needs while accommodating the needs of patients and family members. While decision making is guided, in part, by emerging evidence and industry guidelines, multiple perspectives and experiences from those actually occupying the ICU space on a daily basis must be considered in tandem [17]. Cross-disciplinary input from clinicians and feedback from patients and families is vital for designing ICU spaces that are efficient and effective. As such, architects are increasingly utilizing focus groups and simulation labs (e.g., prototypes, full-scale room mock-ups) to test design concepts, gather practice knowledge, and—as an interdisciplinary team—weigh advantages and drawbacks. Not all clinicians support family presence, but attitudes and behaviors towards family involvement are changing, particularly as clinicians gain more experience working alongside families [18]. Stakeholder inclusion in design processes can further help dissolve lingering resistance to PFCC by encouraging the co-creation of optimal solutions. By integrating research with practice, this collaborative approach not only helps facilitate the adoption of PFCC among staff, but also fulfills a commitment to PFCC values of *collaboration*, *knowledge sharing*, and *partnership*.

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