Group D-4 | Problems and Potential Solutions for Operating Room Environments in the USA

COA SHOWCASE

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Introduction

Operating rooms (ORs) are complex components within healthcare facilities, and their design significantly impacts the quality of care and user experiences. Previous studies have identified OR environment challenges such as surgical site infections and room temperature, humidity, and noise issues. This paper examines data from the Facility Guideline Institute (FGI) Reimagining OR Workshop, focusing on identifying prevalent problems and exploring potential solutions for OR environments in the USA from both designers' and clinicians' perspectives.

FGI Workshop

The workshop, facilitated by the Sextant Foundation, was a collaborative effort between the Association of Operating Room Nurses (AORN) and FGI. It applied human-centered design principles for identifying and addressing challenges in OR environments. The process spanned 1.5 days and involved approximately 100 participants, including clinicians, designers, students, and researchers. They were engaged in various stages, including engagement, empathy, challenge definition, process mapping, ideation, prototyping, testing, presentation, and assessing code implications. Participants were grouped into ten multidisciplinary teams, each developing a prototype to address specific OR challenges.

Research Methods

The research team conducted a qualitative analysis of the workshop data and identified patterns and themes. The researchers also critically reviewed the proposed prototypes, considering practical and policy barriers.

Results

The workshop identified various OR challenges, including logistical issues, medical staff workload and well-being, and patient and family experiences. The teams proposed ten prototypes, including robotics for efficient supply and equipment delivery, an AI-driven drone-based system for inter-hospital supply management, smart case carts tailored to surgeons' preferences, AI and sensors for real-time OR monitoring, a self-learning case cart system, AR for OR setup assistance, flexible and adaptive OR designs, environments to improve medical staff experiences and well-being, pre- and post-operation spaces for family engagement, and an iPad app-supported standardized itinerary for enhancing patient and family communication.

Discussion

The workshop highlighted an urgent need for OR environment improvements. Prototypes involving advanced technologies, such as AI, AR, and sensors, may be challenging due to technological development needs. However, technologies like tablet apps and robots are already being used in healthcare settings. Drone-based systems might face regulatory challenges, while concepts like adaptable ORs and spaces for family engagement are immediately applicable. The collaborative effort between clinicians and designers led to innovative concepts and potential solutions. However, most prototypes require further development and rigorous evaluation to ensure their feasibility and effectiveness in real-world healthcare settings.