



**Laura Zimmer**

美国建筑师协会会员、美国医疗建筑师学院会员、循证设计认证鉴定师，现任Perkins+Will建筑事务所资深助理董事、资深项目建筑师、医疗及养老设施主持规划师。Laura在北美和全球医疗设施的规划设计领域拥有近30年的工作经验，非常了解当前的医疗发展趋势，能够通过妥善的医疗空间组织布局来协助确立工作过程和优化性能表现。代表项目：肯尼亚妇幼健康中心、约翰霍普金斯医院、莱斯大学医疗中心、斯科利普斯医院扩建改造项目、斯波丁康复医院等。

## WHAT IS THE FUTURE FOR HEALTHCARE DESIGN?

### 何为医疗设计的未来？

撰文 Laura Zimmer Perkins+Will建筑事务所

今天的医疗设计旨在革新医疗环境，为患者带来更理想的疗效。然而，现在所践行的一些医疗设计标准在几年前可能还被视为设计创新。为了应对持续的变化和客户需求的转变，医疗行业目前正面临着种种问题。通过解读当前的若干设计创新手段，我们也许会对未来几年的医疗设计发展趋势有所了解。

#### 技术的应用

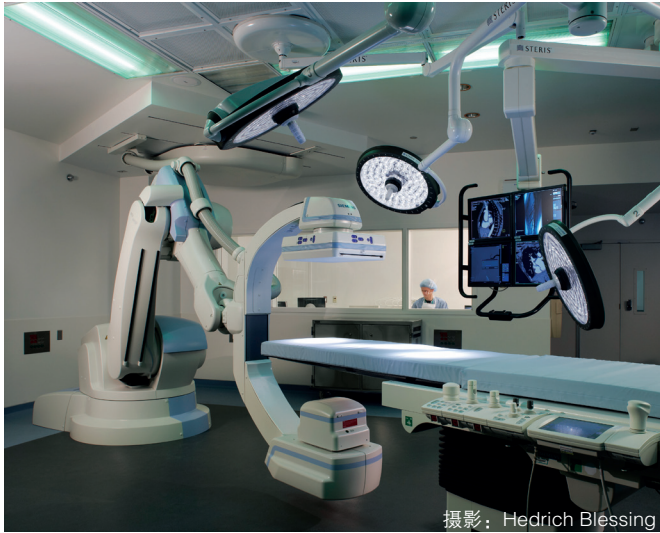
技术对当前的医疗设计已经发挥了重要的影响，并将继续影响未来医疗设施的设计。今天的技术在外观和尺寸上均有多种表现形式，在病床边、手术室里和医护人员的口袋中都触手可及。技术的应用形式既有固定式，也有活动式。如同机场航站楼支持多种购票和登机手续办理方式那样，患者可以通过家用电脑或自助终端来进行预约挂号，以防在医院挂号台出现拥堵现象。

便携式技术除了使临床医师能更好地护理患者外，还开始对病情监测和疗效产生广泛的影响。便携式技术还能使行动不便的门诊患者在家中自行验血，然后通过手机将检验数据传到医院检验科和医生办公室。通过复合杂交手术室的技术使传统的手术室配备先进的医疗设备，以便为患者提供优化的护理服务。另外，近期有证据表明，当前的技术使护理团队内部能够实现患者信息共享，便于在患者治疗期间进行研究工作，达到更好的疗效。

Today's healthcare design is about transforming healthcare environments to create better health outcomes for patients. What we consider standard practice in today's healthcare design may have been thought innovated several years ago. Currently, the healthcare industry is confronting issues brought on by continual change and by clients with needs shifting regularly. It is challenging to determine what the future holds for healthcare design. By looking at some of today's design innovations, we may see an indication of what healthcare design may become in the years ahead.

#### Technology

Technology has had a significant impact on recent healthcare design and it will continue to influence the future design of healthcare facilities. Today's technology comes in many shapes and sizes and can be found at the patient bed-side, in the operating room, and in the pockets of medical staff. It can be mobile or fixed. Like airport terminals, patients can check-in for appointments on home computers or using on-site interface self-service kiosks that help to prevent bottlenecks at registration desks. Wearable technology is beginning to have a widespread influence on patient monitoring and outcomes in addition to allowing clinicians to better administer care to patients. Portable technology allows the outpatient with limited mobility to do their own blood tests at home and transmit the data via telephone to the hospital laboratory and the physician's office. The technology incorporated into hybrid operating rooms allow traditional ORs to be outfitted with advanced medical equipment to provide enhanced care delivery to patients. In addition, recent evidence has shown that current technology is allowing patient information to be shared among the care team to research and collaborate in the patient's treatment and to achieve better patient outcomes.



摄影: Hedrich Blessing

莱斯大学医疗中心 新住院楼介入型手术室



摄影: Anton Grassl & Esto, James Steinkemp

斯波尔丁康复医院 康复治疗室



摄影: Hedrich Blessing

莱斯大学医疗中心 骨科门诊楼标准诊室

### 灵活性、标准化和模块化设计

要和今天的医疗技术保持同步，就要提供改造既有空间所需的灵活性，蓄积发展壮大的潜能。对于追求通过医疗设施的适应性满足发展转型需要的客户而言，医疗设计的灵活性具有战略性的意义。医疗客户希望设施在不干扰医疗服务和不影响患者安全及健康的情况下，能够改变空间的要求。还希望所做的变化多侧重于功能需求，少侧重于实体空间。至关重要是使建筑环境有能力在不改变建筑的条件下，支撑多种功能需要。构筑建筑环境的设计要素和设计工具有很多，医疗使用者可通过移动隔墙、活动家具及其他可

### Flexibility, Standardization, and Modular Design

Keeping up with today's medical technology requires flexibility to modify existing space and the potential to expand. Flexibility in healthcare design is strategic to clients who are seeking adaptability within their facilities to accommodate growth and transformation. Facilities want to be able to change space requirements without service disruptions and without compromising the safety and health of their patients. They want the changes to focus more on function and less on the physical space. The ability of the built environment to support many functions without modifying the architecture is imperative. With many of the available design components and tools available in constructing the built environment, healthcare users can modify their existing spaces with the use of movable walls, mobile

变的要素改变现有的空间。今天的医疗设施设计必须具有应对发展变化的灵活性。

近年来，医院的护理单元开始设计支持多种患者类型和多种临床服务的住院病房。住院病房的设计力求适应患者的各个阶段的病情变化，以免转换病房。对住院病房的尺寸、基础设施及其他特征进行标准化设计，使病房能够适应从轻症到重症的需求变化。护理单元的辅助房间也进行标准化设计，还能根据护理单元的类型进行功能互换。今天的住院康复室可成为明天的宣教/会议室。

今天的许多门诊设施已成为一系列模块，配有一定数量的诊室，用于满足不同医学专业的使用需要。在这些模块中，诊室采用标准化设计，存在一定的限制，不专属于某位医生。临床模块的用途根据实际需要灵活确定，今天可能用作基本护理门诊，明天用作骨科门诊。

**拥有自然采光和自然景观**

除了为建筑环境提供最大限度的灵活性，当今的医疗从业者和医疗设施运营者都开始尽量避免使用人工照明，关注日照采光和景观视野在帮助患者康复和保健的过程中所发挥的疗效。研究表明，处在天然日照下能够使人减少痛苦，缓解沮丧情绪，康复得更快。部分研究还发现，当工作场所拥有更多自然采光时，员工的表现会大大提升。尽管外科手术等特定服务还将一直需要人工照明和专业照明，但利用更多的自然日照有利于从整体上节约能源和成本，这也是当今的医疗设施力求达到的目的。

接触自然和花园景观对患者也有康复疗效。对于病情难以控制的患者，疗愈花园能够积极分散患者的注意力，缓解症状，带来幸福感。在医疗设施内设置绿化不仅对患者有康复疗效，对访客和员工也有提神的效果。这些花园景观为沉思静想、缓解压力和短暂休憩提供了静谧的港湾。

**以患者为中心的护理服务**

过去几年里，一些医疗设施开始积极接受以患者为中心的护理观念，将其作为患者护理服务中的核心部分。护理人员和患者及其家属共同协作，满足患者在治疗过程中的需要。护理团队积极主动

furniture, and other changeable components. Today's healthcare facility designs must provide the flexibility to anticipate change.

In recent years, hospital nursing units have inpatient rooms that are being designed to support an extensive range of patient types and clinical services. Inpatient rooms are being designed to adapt as a patient's condition changes and to eliminate multiple relocations within the facility. Standardizing inpatient rooms in size, infrastructure and other features allows these inpatient rooms to change from low-acuity use for general patient functions to high-acuity use for critical care patients. Nursing Unit support rooms are also being standardized to switch functions based on the type of Nursing Unit. Today's inpatient rehab room can be tomorrow's educational /conferencing room.

Many of today's outpatient facilities have become a series of modules with a specific number of exam rooms that allow for use by different medical specialties. Within these modules, exam rooms are standardized with limited features and are not assigned to specific physicians. A clinic module may accommodate a Primary Care Clinic one day and an Orthopedic Clinic the next.

**Access to Natural Light and Nature**

In addition to maximizing flexibility in their built settings, today's healthcare practitioners and facility operators are pushing away from the use of artificial lighting and focusing on the therapeutic benefits of natural light and views to nature in helping to cure patients and promote wellness. One hundred years ago, it was observed that patients exposed to natural light and views of nature recovered faster than those patients who had no access to natural light. Recent studies have shown that exposure to natural light reduces pain and depression in patients. Some of these studies have also found that employee performance is enhanced when more natural light is available in the work place. Though artificial and specialty lighting will always be required for specific services such as surgery, increased use of natural light contributes to overall energy efficiency and cost effectiveness which today's healthcare facilities are striving to achieve.

As well as access to natural light, studies have shown that access to nature and gardens also have a healing effect on patients and help to reduce stress. For patients with little control of their current condition, healing gardens provide a positive distraction in relieving symptoms and providing a sense of well-being. The restorative effects of green spaces within healthcare facilities are not just for patients, but also for visitors and staff. These gardens provide quiet havens for meditation, stress relief, and respite.

**Patient Centered Care**

In the past several years, some healthcare facilities have embraced Patient Centered Care and have made it a core component of their patient care delivery. The care providers work together with patients and their families to



摄影：Anton Grassl & Esto, James Steinkemp

斯波丁康复医院 患者公共交流区



摄影：Anton Grassl & Esto, James Steinkemp

斯波丁康复医院 住院康复区



莱斯大学医疗中心新住院楼 住院病房内设有家属区和医护工作室



莱斯大学医疗中心新住院楼 住院病房



莱斯大学医疗中心新住院楼 物流隧道的自动导向车



莱斯大学医疗中心新住院楼 自动导向车控制中心

地参与到护理规划和应用的各个方面。近年来，以患者为中心的护理服务已经对病房的设计发挥了影响力，病房内开始围绕病床设置家属区和员工区。

### 精益医疗

此外，过去几年里，精益原则已经应用到医疗领域当中。医疗设施正力求扩大自身价值，实现高效运营，同时降低人力资源和自然资源的消耗。如今，在医疗设施调动各种资源提供服务之时，患者和家属都被摆到第一位。为了实现持续性提升，许多医疗设施都在采用以精益技术和运营为驱动的设计。精益医疗的基本要素包括灵活性和标准化空间。

### 结语

今天的医疗设施重视健康与康复，正将当前的医疗发展趋势结合到医院新建和改造项目当中。对于未来的医疗设计师而言，面临的挑战是要在当地的环境条件下，创造美观独特和因地制宜的设计，并将其融入到下一轮的创新浪潮当中。未来的医疗设计创新极可能仍会将康复作为工作重点，将技术的应用和灵活适应性的需要作为激发创新的驱动力。（译/严佳钰，校/张洁）

ascertain and satisfy the patient's preferences and needs in treatment with a focus on healthy outcomes. The informed care team aggressively engages in every level of care planning and application. In recent years, patient centered care has had an impact on the design of inpatient rooms providing family zones and staff zones around the patient bed.

### Lean Healthcare

Additionally in the last several years, lean principals have been applied to healthcare. Healthcare facilities are striving to maximize their facility value and to be operationally efficient while reducing human and natural resources. Today, patients and families come first as facilities use resourceful methods in delivery of services. To establish a culture of continuous improvement, many facilities are adopting lean techniques and operations driven design. Primary components of Lean Healthcare include flexibility and standardize space.

### Conclusion

With focus on health and healing, today's healthcare facilities are incorporating current trends into their renovations and new facilities. The challenge for tomorrow's healthcare designers will be to make their designs pleasing, appropriate, and unique in the local context and to incorporate the next wave of innovation. It is probable that the new innovations in tomorrow's healthcare design will still be focused on healing and will be generated by technology and the need to be flexible and responsive. 