

Design of hospitals

Hospital design involves creating environments that support the health and well-being of patients, the efficiency of healthcare workers, and the integration of advanced medical technologies



1. Functional Zoning

Hospitals are typically divided into several key zones to improve functionality:

- **Patient Care Zones:** Inpatient rooms, outpatient clinics, intensive care units (ICUs), operating rooms, etc.
- **Diagnostic and Treatment Zones:** Imaging departments (X-ray, MRI, etc.), laboratories, and therapy spaces.
- **Public Zones:** Lobbies, waiting areas, cafeterias, and restrooms for visitors.
- **Staff and Support Zones:** Offices, meeting rooms, break rooms.

The design must facilitate an easy flow of patients, staff, and supplies between these zones, while minimizing unnecessary travel.



2. Patient Experience

- **Comfort and Healing Environment:** Elements like natural light, noise control, and private rooms contribute to a healing environment. Colors, textures, and furniture are often chosen to promote calmness and reduce anxiety.
- **Safety:** Safe environments for both patients and staff are critical.

3. Infection Control

- **Air Quality and Ventilation:** Specialized systems ensure the appropriate air circulation in operating rooms, isolation rooms, and critical care units to prevent the spread of airborne diseases.
- **Materials:** Surfaces should be easy to clean and disinfect.

4. Staff Efficiency and Well-being

- **Proximity and Access:** The layout should minimize the distance healthcare staff must travel between frequently visited areas, such as between patient rooms and nurse stations.

5. Patient Safety and Privacy

- **Noise Reduction:** Designing rooms with sound-absorbing materials and providing quiet zones are essential for patient.
- **Room Design:** Single-patient rooms offer more privacy, reduce infection risk, and promote faster recovery compared to multi-bed wards.

6. Emergency Preparedness

Hospitals must be designed with robust emergency response systems, including disaster-resistant structures (for earthquakes, floods, etc.), backup power systems, and dedicated spaces for mass casualty events.



of

Types

systems in hospital

1. Electrical Systems:

- **Power Supply:** Hospitals require a highly reliable power supply including backup generators, uninterruptible power supplies (UPS).
- **Lighting:** Energy-efficient lighting, such as LED systems, should be integrated with natural daylight to improve patient comfort.

2. Plumbing Systems:

- **Water Supply and Quality:** Hospitals require a constant and high-quality water supply for patient care, and medical procedures.
- **Wastewater Management:** The design must account for the safe disposal of medical and chemical waste through specialized systems, including sterilization and decontamination of water used in laboratories and operating rooms.
- **Medical Gases:** Hospitals need a system to deliver medical gases like oxygen, nitrous oxide, and compressed air to patient areas.

3. Fire Safety and Life Safety Systems

- **Fire Detection:** Smoke detectors, heat detectors, and fire alarms are integrated into every part of the building.
- **Compartmentalization:** Fire-resistant walls and doors are used to compartmentalize areas, preventing the spread of fire and smoke.
- **Evacuation Planning:** Engineering design includes clearly marked and accessible emergency exits, as well as fire-resistant stairwells and emergency lighting.