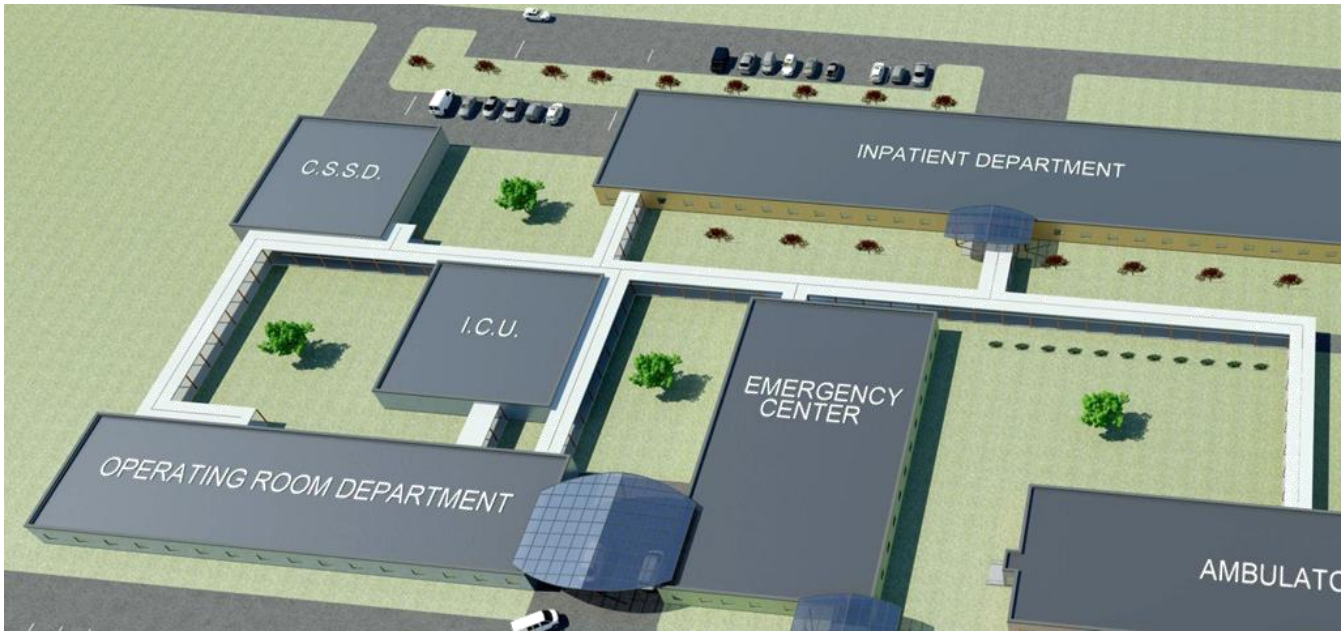
Prefabricated medical facilities

Schematic design and preliminary estimation

OUR PROFILE-Preview

- **Inpatient wards;**
- **Delivery rooms;**
- **Intensive care units/high dependency units (N.I.C.U., P.I.C.U., M.I.C.U.);**
- **Operating rooms (general, ultra clean, septic, hybrid);**
- **Outpatient clinics, consultant rooms day care units, chemotherapy, pain management, Dialysis, etc.;**
- **Administrative space;**
- **Physiotherapy, rehabilitation centers;**
- **Imaging–radiology;**
- **Laboratories, logistics units and more.**

Health care is the sector which currently features the highest use of prefabricated modular constructions with the most notable growth in the future.

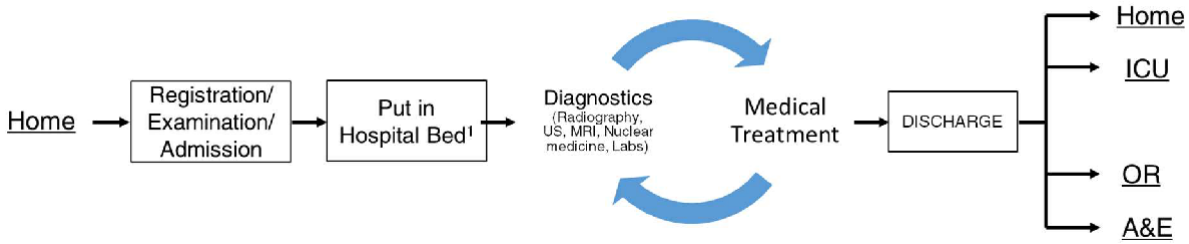


1: INPATIENT DEPARTMENT

Definition

Inpatient department provides appropriate facilities and conditions to meet the needs of the patients and visitors as well as workplace requirements of staff for the delivery of around-the-clock health care services including diagnosis, care and treatment to inpatients. Unit provides safe and secure environment for patients, staff and visitors, while remaining a non-threatening and conducive to recovery.

INPATIENT DEPARTMENT PATIENT FLOW DIAGRAM

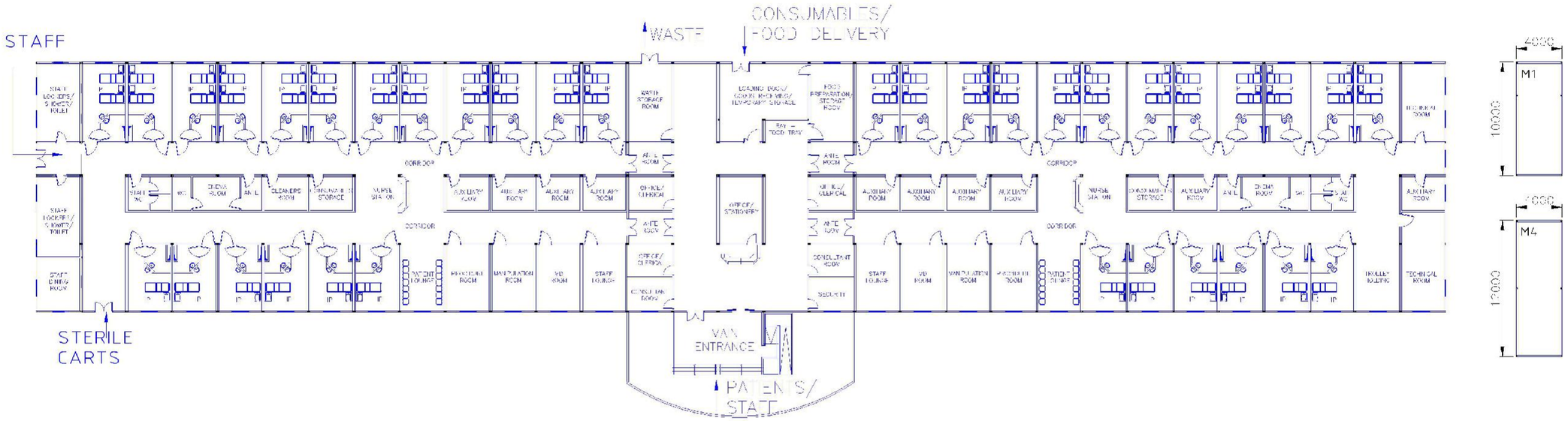


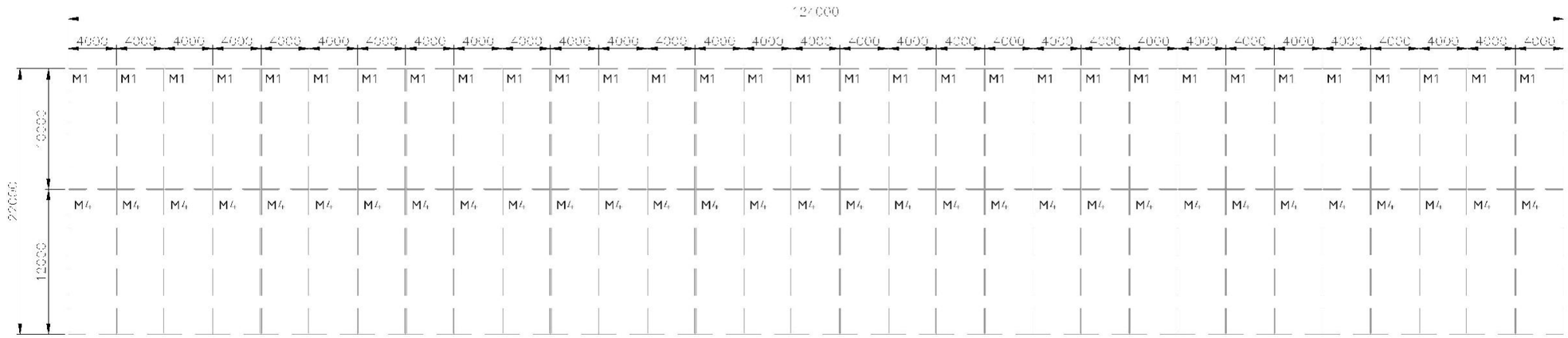
Well-considered design allows to keep nursing fatigue factor low, avoid crisscrossing of dissimilar traffics, and keep constructional and operational costs low, whilst providing full service to the patient.

In order to deliver function, it is necessary to consider optimal adjacency of involved functional rooms, which are the following:

- **Patient wards;**
- **Isolation rooms;**
- **Clean stores;**
- **Soiled item stores;**
- **Equipment and consumable stores;**
- **Nurse station;**
- **Administration offices;**
- **Reception;**
- **Staff amenities.**

INPATIENT DEPARTMENT OF 2 WARDS
TOTAL 60 BEDS





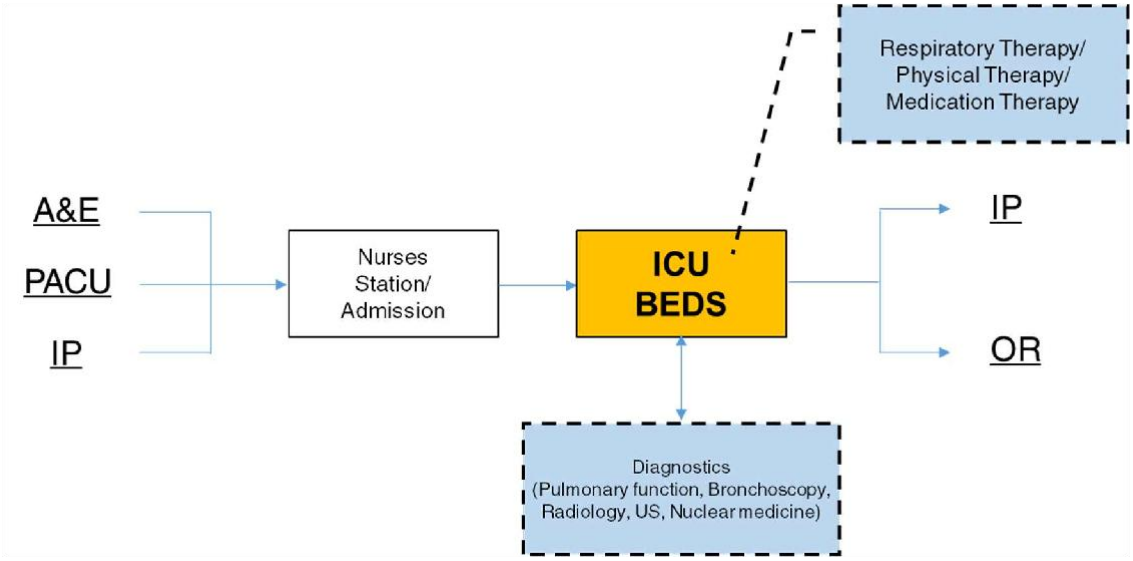
INPATIENT WARD OF 2 DEPARTMENTS			
Module type	**Sqm**	**Amount**	**Area (m^2)**
M1	**40**	**31**	**1240**
M4	**48**	**31**	**1488**
		Total:	**2728**

2: INTENSIVE CARE & POST ANESTHESIA CARE UNIT

Definition

Intensive care & post anesthesia care unit provides concentration of clinical expertise, technologies and therapeutic resources - high level medical and nursing care, monitoring and support from specialist equipment and medications, in order to care for seriously ill patients by ensuring normal bodily functions.

INTENSIVE CARE PATIENT FLOW DIAGRAM



Specially trained staff ''the ICU staff'' includes highly trained doctors, nurses, respiratory therapists, clinical nurse specialists, pharmacists, physical therapists, nurse practitioners, physician assistants, dietitians and social workers, who each care for one to two patients at a time.

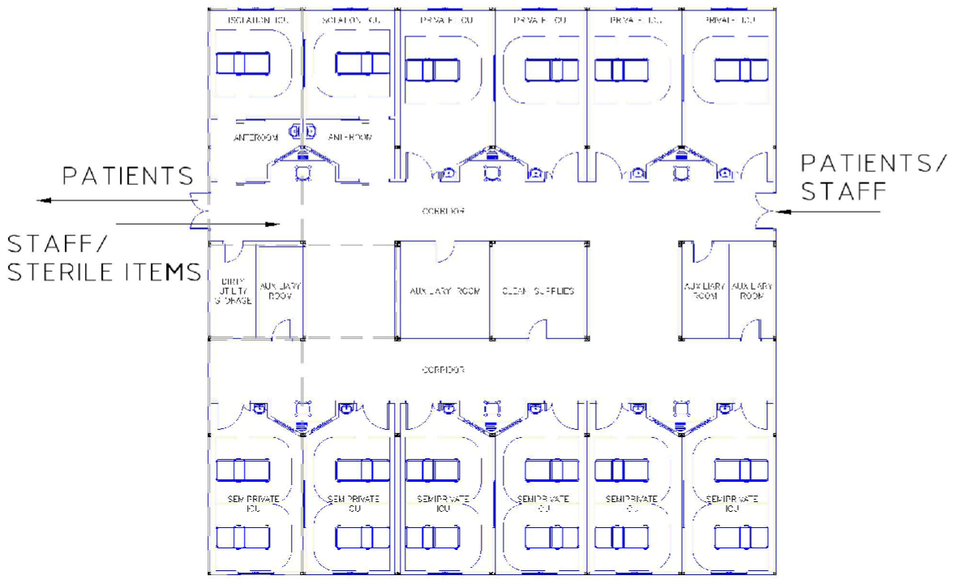
ICU's are distinguished from normal hospital wards by a higher staff-to-patient ratio and access to advanced medical resources and equipment that is not routinely available elsewhere.

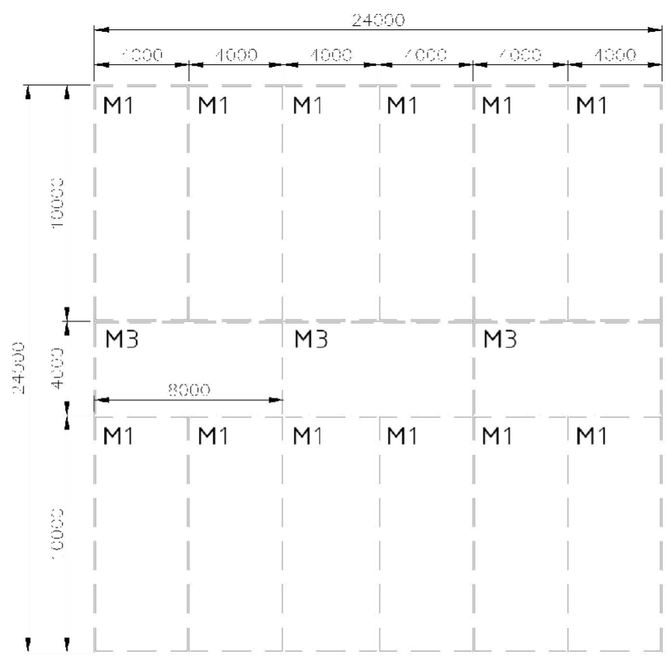
Patients may have special equipment in their room, depending on their unique situation and condition.

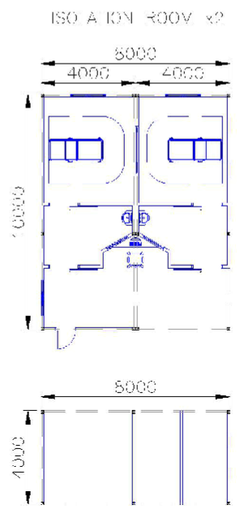
Patients are connected to machines to monitor their heart, blood pressure, and respiratory rate.

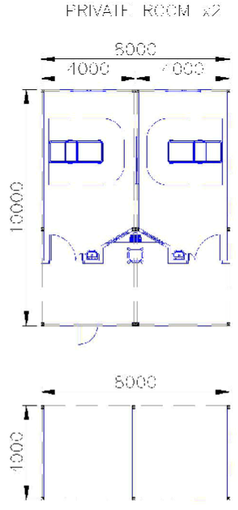
Ventilators assist some patients with breathing until they are able to breathe on their own.

INTENSIVE CARE & POST ANESTHESIA RECOVERY UNIT OF 18 BEDS









INTENSIVE CARE UNIT			
Module type	**Sqm**	**Amount**	**Area (m^2)**
M1	**40**	**12**	**480**
M3	**32**	**3**	**96**
		Total:	**576**

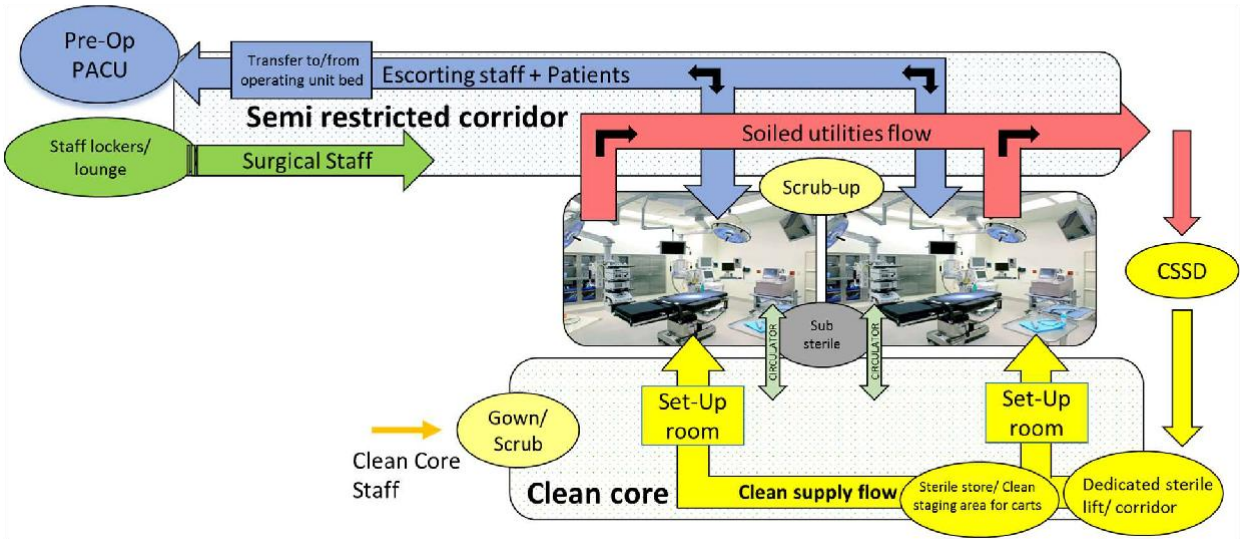
3: OPERATING ROOM DEPARTMENT

Definition

The operating room department provides a safe, controlled environment for patients undergoing surgical procedures to restore optimum health and wellness. The operating room/ post anesthesia recovery staff provides quality–conscious, competent, and cost–effective care with the respect for life, dignity, and patient privacy.

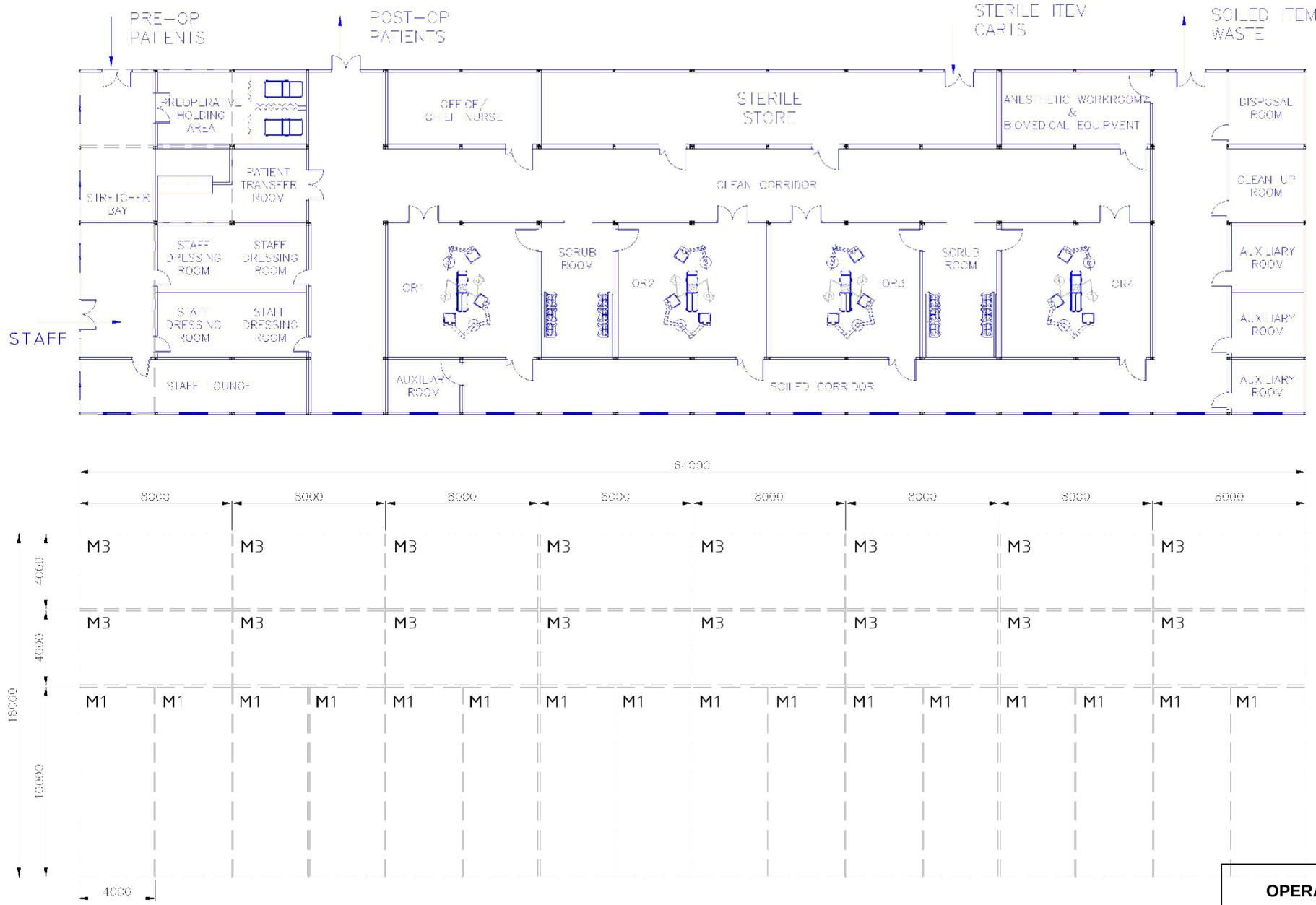
Department is designed to promote high standards of asepsis during procedures and perioperative care. It is mainly achieved by using physical separation of traffic, air filtering from harmful particulate matter, use of personal protective equipment and provision of constant invariable quality sterile supplies for procedures, as well as regular facility cleaning/ disinfecting.

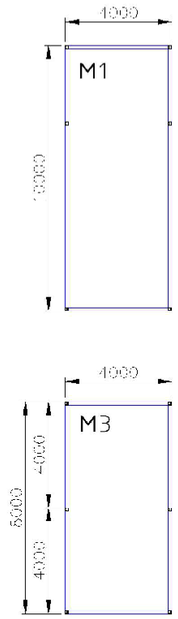
OPERATING ROOM FLOW DIAGRAM



Economical factor is taken into account by ensuring maximal flexibility of facilities, optimization of operating, technical and support room distribution and required staff travel time, as well as optimizing working conditions without affecting care quality.

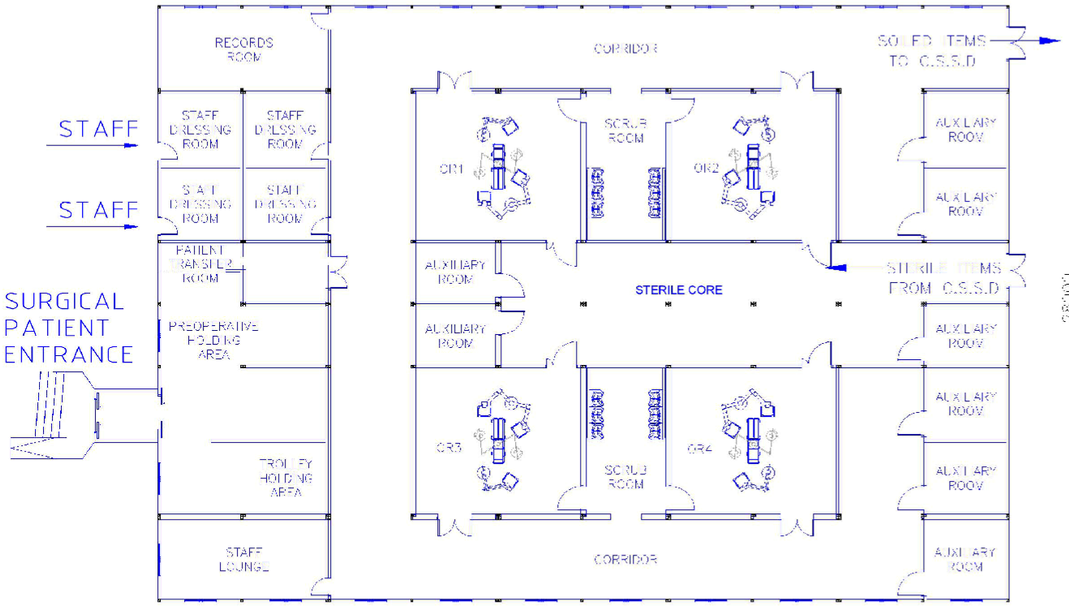
4 OPERATING ROOM – GERMAN CONCEPT

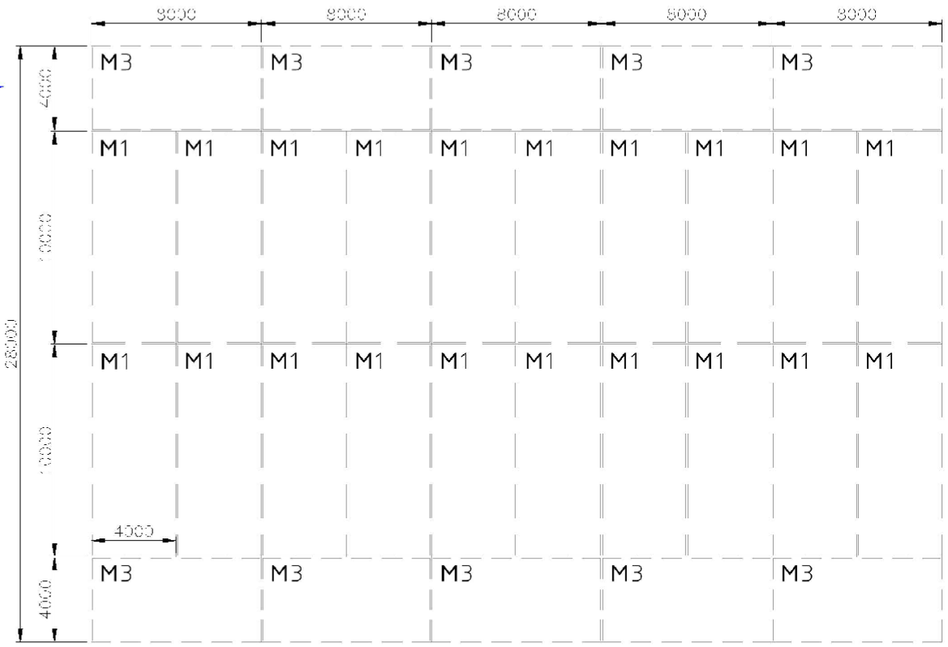


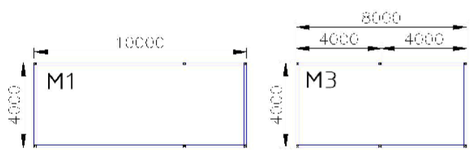


OPERATING ROOM - GERMAN CONCEPT			
Module type	**Sqm**	**Amount**	**Area (m^2)**
M1	**40**	**16**	**640**
M3	**32**	**16**	**512**
		Total:	**1152**

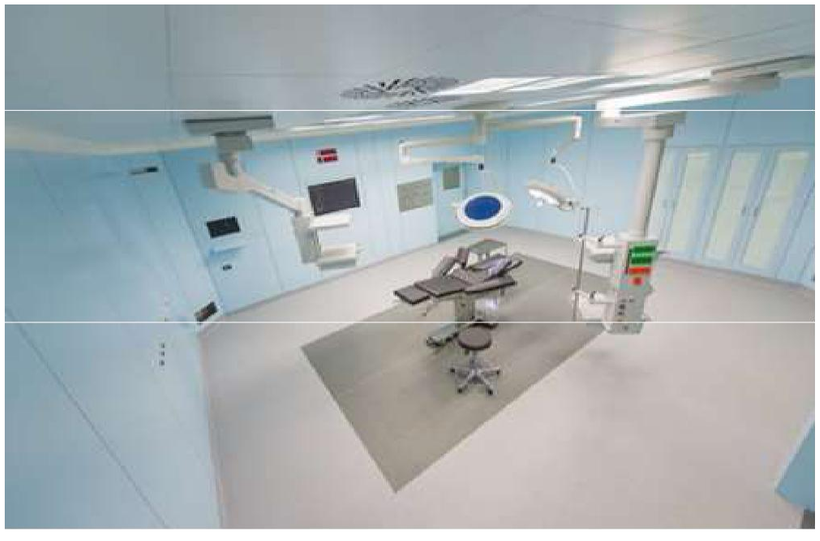
4 OR's Sterile Core Configuration

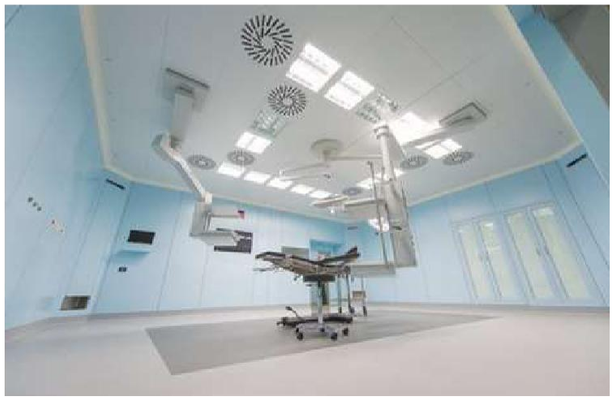






OPERATING ROOM - STERILE CORE CONFIGURATION			
Module type	**Sqm**	**Amount**	**Area (m^2)**
M1	**40**	**20**	**800**
M3	**32**	**10**	**320**
		Total:	**1120**





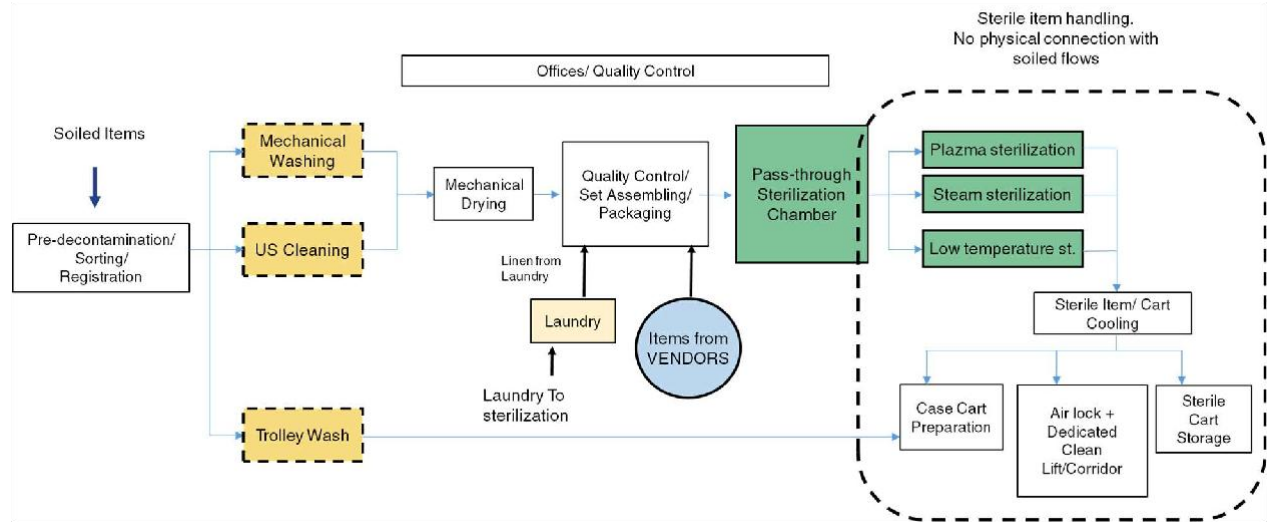
4: CENTRAL STERILE SUPPLY DEPARTMENT

Definition

Central sterile supply department is a support service entrusted with processing and issue of supplies including sterile instruments and equipment used in various departments of a hospital.

Instrument and equipment processing includes pre-cleaning, rinsing, mechanical washing, drying, packaging, sterilizing, cart set-up and issue of ready to go sterile supply carts to various campus departments.

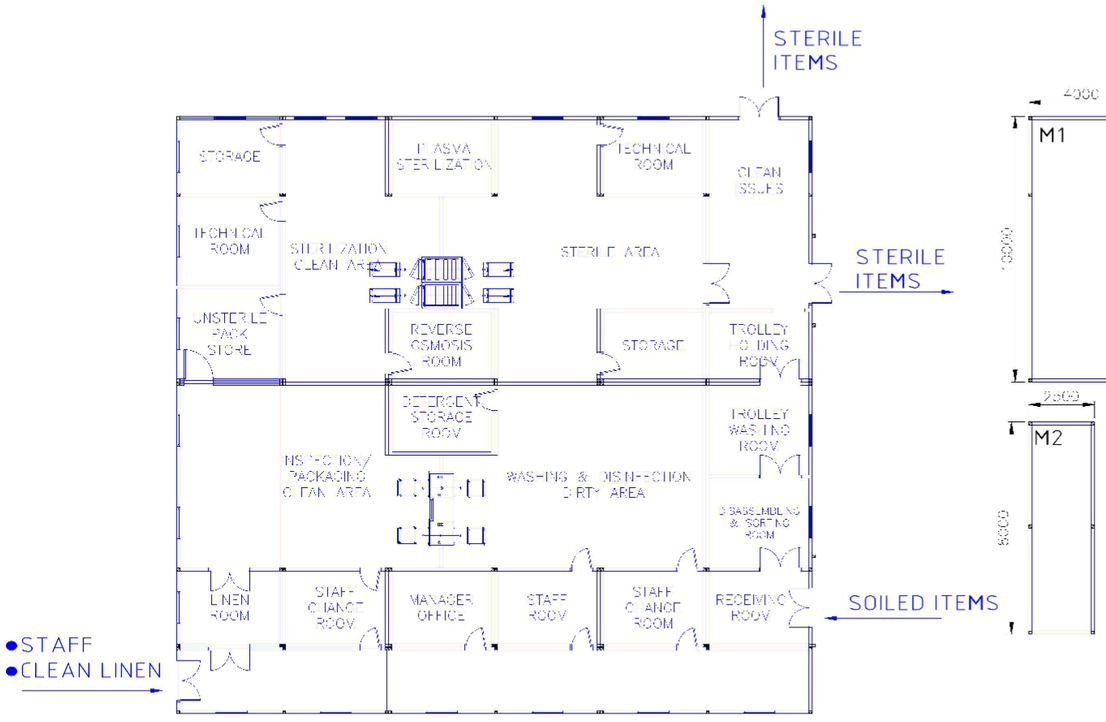
CENTRAL STERILE SUPPLY DEPARTMENT FLOW DIAGRAM

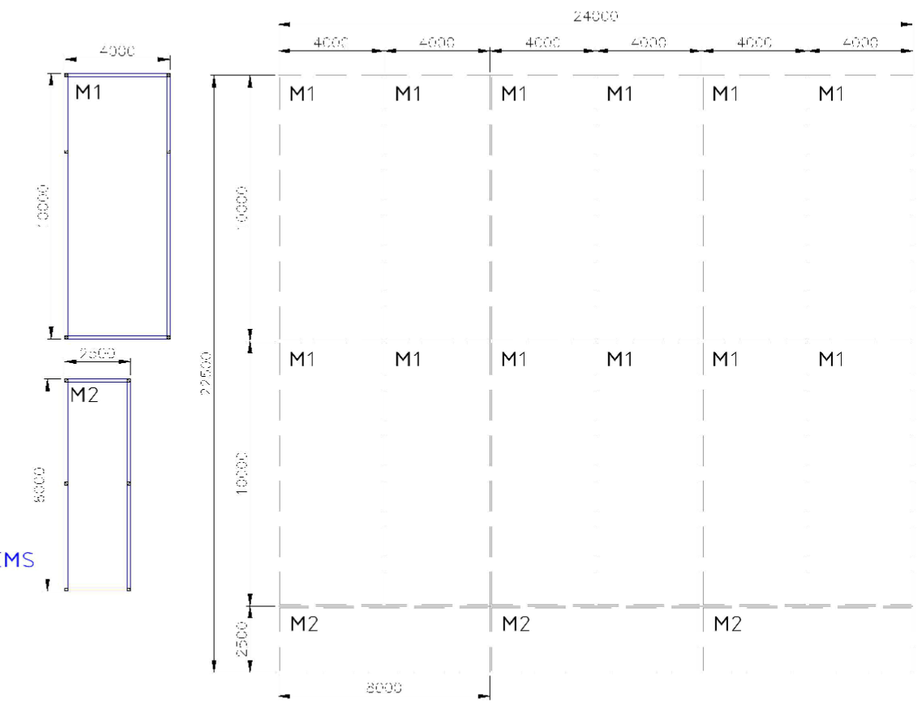


Department organizes and improves its operation to provide enough sterile supply based on previous demand.

Sterile supply flow is organized and appropriate aseptic measures taken to reduce chance of cross infection.

CENTRAL STERILE SUPPLY DEPARTMENT





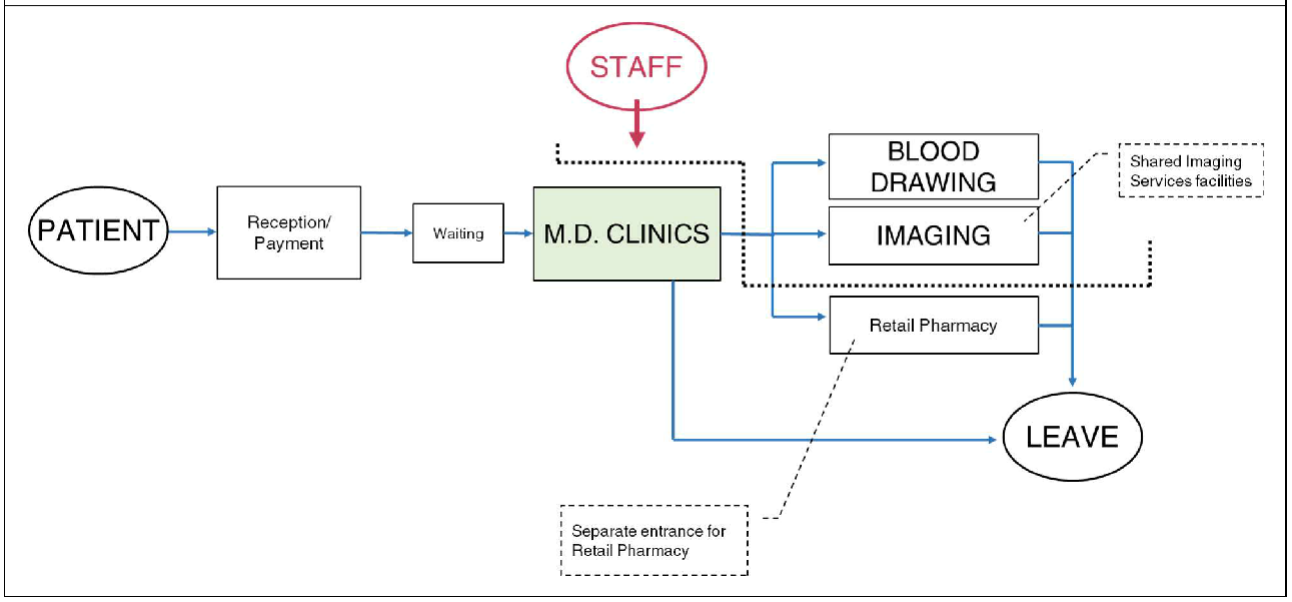
CENTRAL STERILE SUPPLY DEPARTMENT			
Module type	Sqm	Amount	Area (m^2)
M1	40	12	480
M2	20	3	60
		Total:	540

5: AMBULATORY CLINIC

Definition

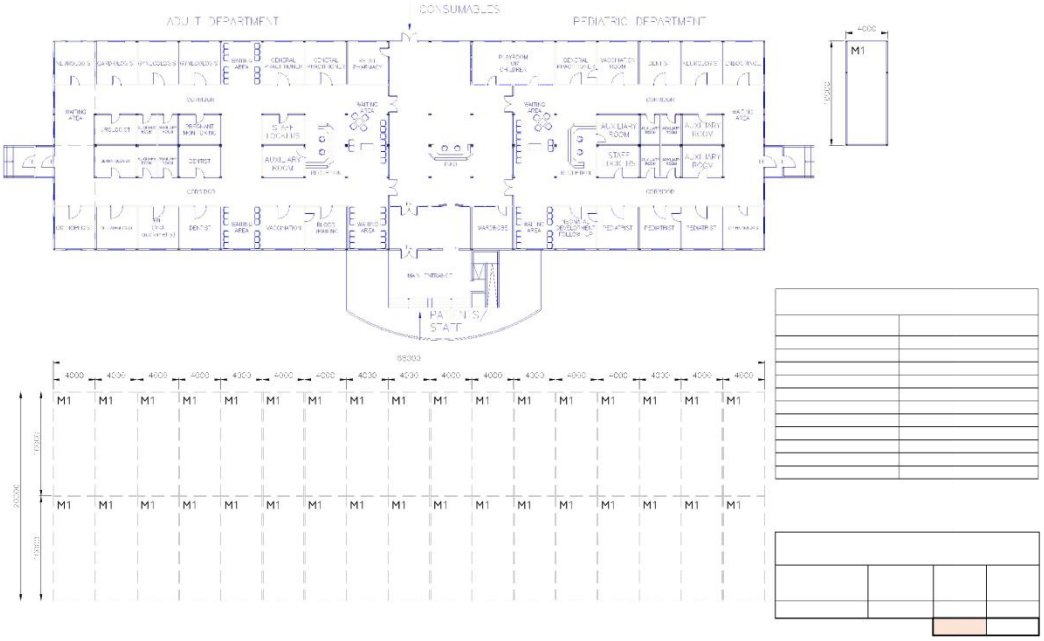
Ambulatory clinic is a facility that provides invasive and/or non-invasive care on a same-day basis. It serves a function of screening, diagnostics and timely treatment as well as general imaging services as x-ray, ultrasonography and endoscopy.

AMBULATORY CLINIC FLOW DIAGRAM



Important design aspects include proper distribution of support facilities, bacteriological control zoning, traffic segregation, sterile and soiled supply traffic and provision of nearby diagnostics services.

AMBULATORY CLINIC

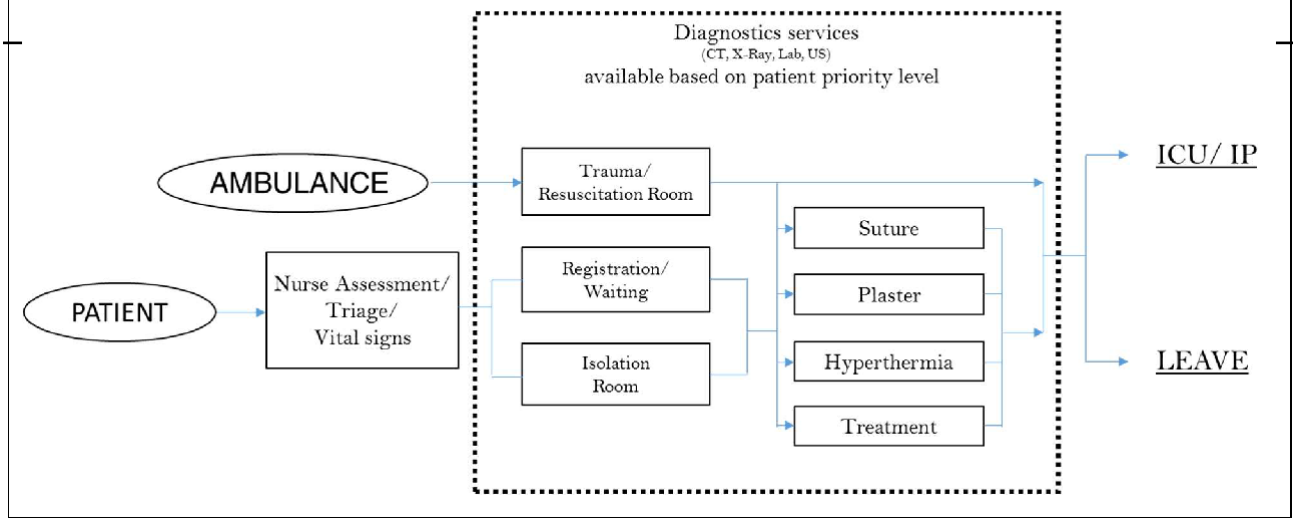


emergency center

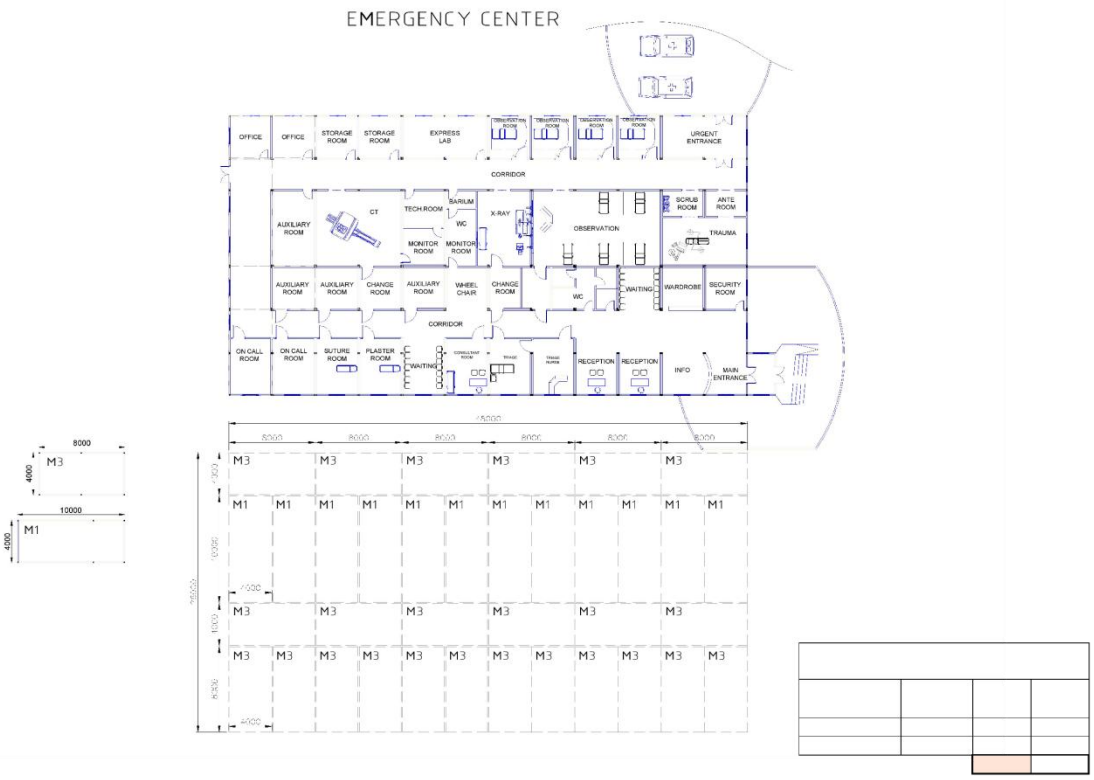
Definition

Emergency center provides a function of receiving, stabilizing and managing patients who present with a large variety of urgent and non-urgent conditions whether self or ambulance referred. Unit also provides management and reception of disaster patients.

EMERGENCY CENTER FLOW DIAGRAM



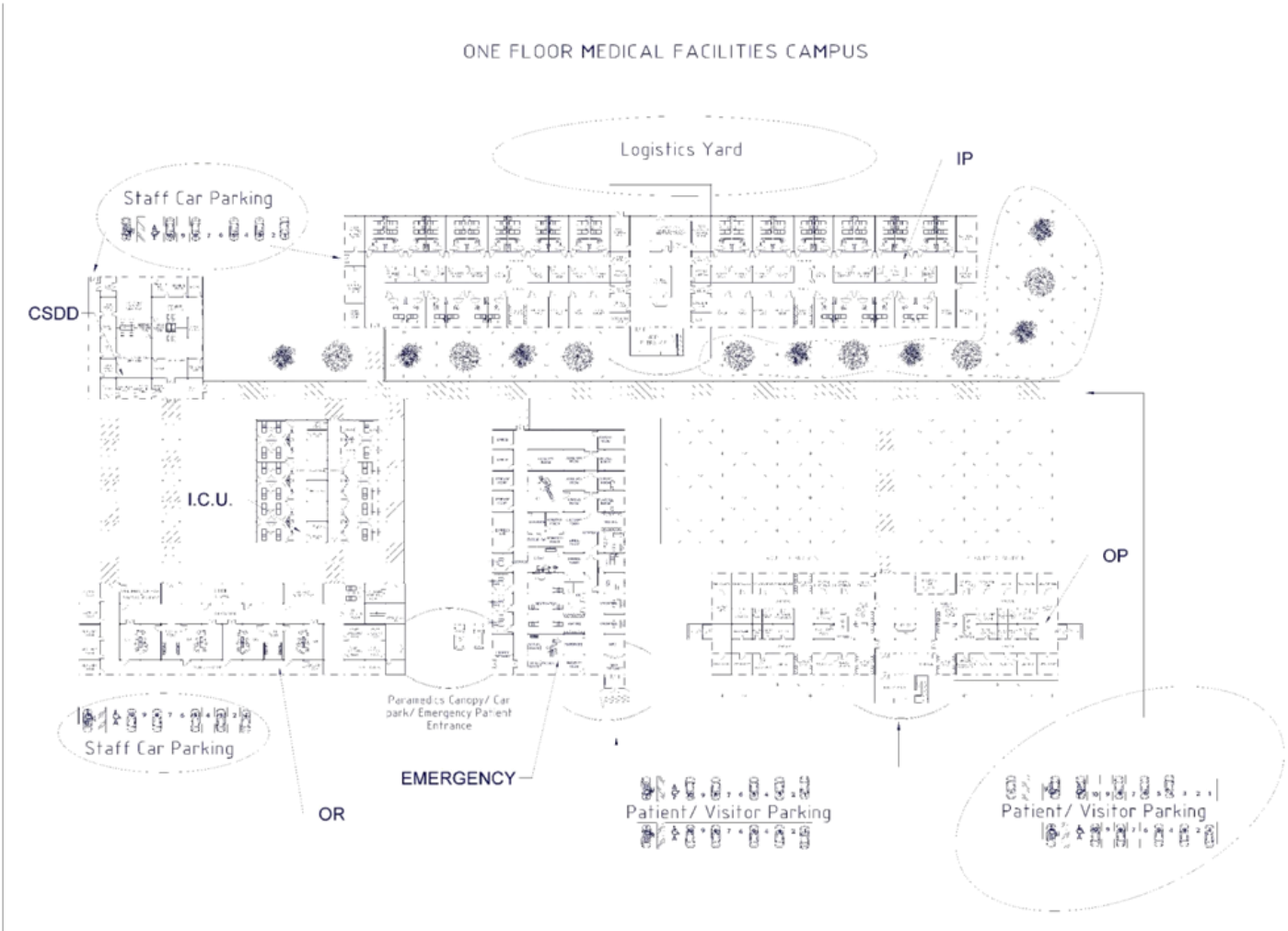
Emergency center is an integral part of healthcare delivery system, where patient turn in case of acute/ urgent health problems.
Well-considered design helps to examine and treat more patients and handle each patient in optimal time window with same staff workload.



7: ONE FLOOR MEDICAL FACILITIES CAMPUS

Description

Discussed single floor medical facilities campus consists of inpatient department, intensive and post anesthesia care unit, operating theatre department, central sterile supply department, ambulatory clinic and emergency room. Inpatient and outpatient departments are designed so that additional floor can be easily erected, and their locations allow construction site to be accessible and discrete from the back or side of the department facilities without affecting patient flow around the campus. Central sterile supply department potential capacity is more than enough to support the campus and additional inpatient and/or outpatient department beds in case of expansion.



PRELIMINARY TECHNICAL DESCRIPTION

The Structure

A computer designed steel structure planned to withstand the required "live loads", Seismic and Regional climatic loads (wind, snow, temp') and fire rated protection cover, all are aimed to meet the international standards.

Our structure is planned to offer:

- **Maximum corrosion resistance;**
- **Maximum mechanical endurance;**
- **Maximum recycled material use;**
- **Minimal self-weight;**
- **Each module is independently structured to withstand full set of external loads, thus, by installing the modules into one combined structure, the overall structure endurance is increased;**
- **Fire resistance.**

Flooring Systems

We can offer flooring system made of:

- **PVC\linoleum;**
- **Wood\parquet;**
- **Ceramic tiles;**
- **Granite porcelain;**
- **Terrazzo tiles;**
- **Epoxy resin floors.**

Wall Systems

The walls are built by multi-layer cement and gypsum boards system which supplies the required partition, acoustics, fire protection standards.

As a finishing covering layer, we can offer one of the following options:

- **Stainless steel panels;**
- **Galvanized steel panels HPL PVC;**
- **Anti-bacterial paint system, decorative paint system.**

Ceiling Systems

We can fit each room requirements by offering an architectural ceiling solution which address the technical needs.

- **Gypsum board**
- **Acoustic panels: different perforation levels**
- **Wood panels**
- **Metal panels**
- **Clean ceiling panels**
- **All option with removable segments to allow accessibility to technical system above**

Doors & Windows

- **Hinged doors**
- **Sliding doors**
- **Hermetic doors**
- **Fire rated doors**
- **X–Ray shielded door**
- **Aluminum double glazing with inserted venetian blinds**
- **Aluminum with thermal glazing**

Exterior Cladding

- **Cement (with/without color pigment) panels**
- **Natural stone**
- **Aluminum-glass panels**
- **Plaster**
- **Wood panels**

In Door Installed Fixtures

- **Inpatient/ICU/Staff sinks**
- **OR’s staff scrubbing sinks**
- **Nurse computer station**

- **OR clock**
- **Nurse call systems**
- **Handrail assistance systems**
- **Flush wall installed cabins**
- **Pass through cabins**
- **Control panels**
- **Clean area illumination fixtures**
- **General and special areas illumination**
- **Mirrors**
- **Soap/gloves/paper dispenser**
- **Clean area illumination fixtures**
- **General and special areas illumination**

Electro Mechanical Systems

- **H.V.A.C**
- **H.E.P.A**
- **Laminar flows system**
- **F.C.U (2PU/4PU)**
- **AHW**
- **Chillers/ Air/ Water cooling system**
- **Heating system (Electrical/ Gas)**
- **Exhaust air units**

Medical Gas System

- **O_2, VAC, N_2O, C. Air, Med Air, CO_2, N_2, SCV**
- **Head wall (I.P) Pendants (ICU, OR)**
- **Examine air systems**

High Voltage/ Low/ I.T. System

- **Grounding systems**
- **Transformers**
- **Diesel/Gas generators**
- **U.P.S**
- **Switchboards**
- **Cables system**
- **Life supporting areas systems**
- **C.C.T.V**
- **Smoke detectors**

General Systems

- **Exhausting (Service, Clean/ Soiled, Public, Staff)**
- **Pneumatic tube system (P.T.S)**
- **Furniture (Stainless steel, wood, HPL, MDF, etc.)**