

STUDY
ON
INFRASTRUCTURE UP GRADATION PLANNING
WITH FOCUS ON
DENTAL WING EXPANSION
OF
PATALIA HOSPITAL AND RESEARCH CENTRE, JAGATPURA, JAIPUR

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INTRODUCTION

- Health is a natural human right and has been accorded due importance in our constitution through its delivery to masses remain daunting despite more than 60years of independence. After various committees recommendations ever since, government has been trying to meet health needs of masses but factors like rising population and rapid urbanization rendering health needs uncompensated.
- Making healthcare affordable and accessible for all the citizens is one of the key focus areas of the health policies of the country today. Fruitful medical research and health facility planning is an emerging sector of health infrastructure development forming the pillars of achieving this difficult but double endeavor.
- Planning of a hospital is a process intended to ensure that all building systems in a facility, including sustainable building technologies are installed and perform in accordance with the design intent that the design intent is consistent with the owner's project requirements and that operations and maintenance staff are adequately prepared to operate and maintain the completed facility.
- Jagatpura, Jaipur and the surrounding areas have substantially prosperous population leading a very comfortable life. This results in a spurt in demand for better healthcare. There had been a specific demand for advanced and quality care. This demand was being met by the Hospitals in Jagatpura to a limited extent. As the demand was rising rapidly there was requirement of new hospital set-ups to come up to cater to those rising needs.

- Patalia Hospital & Research Centre, a 20 bedded hospital is serving since 8 years in Jagatpura, Jaipur.

PHRC MISSION

Our mission is to continually strive to improve how we deliver patient care, keep our knowledge and skills relevant, advance our understanding of illness and health and manage our resources effectively.

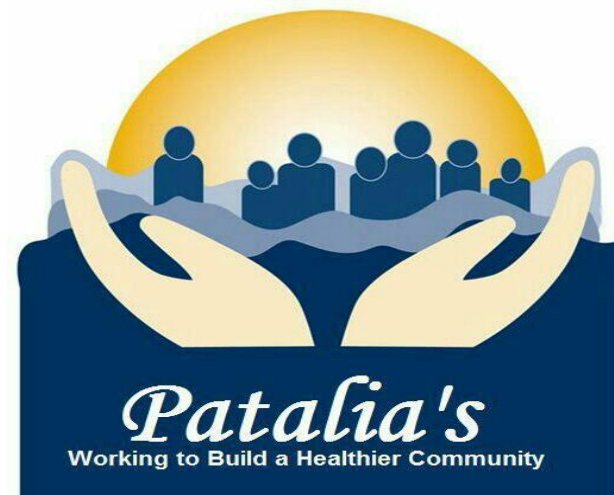
PHRC VISION

Our vision is to provide premium class healthcare to one and all at affordable prices.

VALUES

Our hospital is dedicated to providing health care services through a sincere commitment to our core values of:

Care	“we look after one and all”
Commitment	“ we are dedicated”
Quality	“we do the right thing”
Imagination	“we dream big”



- PHRC identified this need and decided to come up with a 75 bedded Multispecialty hospital in Jagatpura, Jaipur in January 2018 and started planning.
- It entered Jagatpura with a commitment to provide high-quality health services with global standards. It was dedicated to bring out the best of the facility to treat and to maintain any type of critical case under one roof.
- PHRC offered all dental services for screening by way of various tailored dental check-up and diagnostic facilities to aid early detection and treatment of all the dental diseases and other dental hazards. Also, it is backed by a team of leading Consultants General Medicine, General Surgery, Gynecologist, who are recognized as leaders in this field in the area.
- As a result, the existing capacity of the hospital proving to be insufficient to cater to the growing list of their beneficiaries. Hence, they felt the need to increase their capacity. Thus they decided to spread out.
- Furthermore it was found that Jagatpura has the finest of the doctors of Jaipur but it was lacking good infrastructure and professional management and as PHRC is known for quality care at affordable price they decided to expand their services in other fields of medicine in Jagatpura only in order to encash the market opportunity.

OBJECTIVE OF THE STUDY

- To develop an infrastructure up-gradation plan for 75 bedded Patalia Hospital and Research Centre.
- To plan and design the facility management for the Dental wing in PHRC.

METHODOLOGY

- **STUDY DESIGN**

Descriptive study

- **SETTING**

Patalia Hospital and Research Centre, Jaipur

- **DURATION OF STUDY**

3 Months (February 2018- April 2018)

- **DATA COLLECTION PROCEDURE**

Data used for the study was taken from the available data provided by the hospital

PROJECT AT A GLANCE

Project - Tertiary Care Hospital

Promoter – PHRC

Location - Jagatpura, Jaipur , Rajasthan

Capacity - 75 beds

Major Specialties

General Medicine, General Surgery, Gynecology & Obstetrics, Dental Surgery, Food & Dietetics, Cardiology, Orthopedics, Pediatrics, Minimal Access Surgery, Critical Care Management.

SIZE OF HOSPITAL

75-bedded In-patient unit, with suitable component of Outpatient unit, Emergency Department, Clinical Support services & all needed Utility and Support services.

FACILITY MIX

The proposed Tertiary Care Hospital will provide the following services:

Complete range of diagnostic services.

Outpatient consultations.

Intensive care.

Surgical facilities.

Dental Care.

Executive Health Check-ups.

CATCHMENT AREAS

Primary catchment area: Jagatpura, Malviya Nagar, Sanganer, Pratap Nagar

Secondary catchment area:, KhoNagori, Chaksu,.

FACILITIES PLANNING

The proposed specialties for the 75-bedded hospital have been recommended keeping in mind the disease profile and the demographic profile of the region as per the secondary data provided by the hospital. The facilities proposed are of multispecialty nature.

As per the planning done, the Hospital will have an Out Patient Department providing consultations in all major medical specialties along with the Casualty and Emergency Services. There will be a well-provided ambulance service and various amenities including an organized catering service (outsourced). The Emergency/Casualty department is planned to be fully equipped with resuscitation equipments, beside piped Oxygen and suction etc. providing acute care to the admitted patients. The Surgical Intensive Care Unit will provide postoperative intensive care to the critically ill with the help of sophisticated equipments. A Pre/Post operative ward is said to be well equipped.

This is supported by a Comprehensive Diagnostic Service with X-Ray machine, an Ultra Sound Scanner or Doppler Machine, ECG Machine.

FUNCTIONAL AREAS

- Ground coverage: 8000 sq feet.
- Parking space for cars: 5000sq feet.
- Super build up area: 40,000 sq feet.
- Electric supply: Jaipur state power corporation.
- Water supply: Jaipur water supply and sewerage board Jagatpura circle
- Sewage treatment plant: available
- Telephone lines: available
- Load of electricity:1000 kW
- Generator:1250 Kwa

BED MIX

ICU	12
GENERAL WARDS	16
ECONOMY WARD	20
DELUXE ROOMS	10
MATERNITY WARD	05
A and E	04

FUNCTIONAL SERVICES

CLINICAL SERVICES	SUPPORT SERVICES	UTILITY SERVICES
General Medicine	Pathology	Ambulance services
General Surgery	Microbiology	Basic engineering
Gynecology & Obstetrics	Radiology	Housekeeping (outsourced)
Dental Surgery	Pharmacy	Linen and Laundry (outsourced)
Food & Dietetics	Medical Records	Security
Cardiology	CSSD	Hospital waste management
Orthopedics		
Pediatrics		
Critical Care Management		

OPD MIX

No. of beds= 75

No. of OPD days =300

No. of IPD days = 365 Bed days = $365 \times 75 = 27375$

ALOS =3

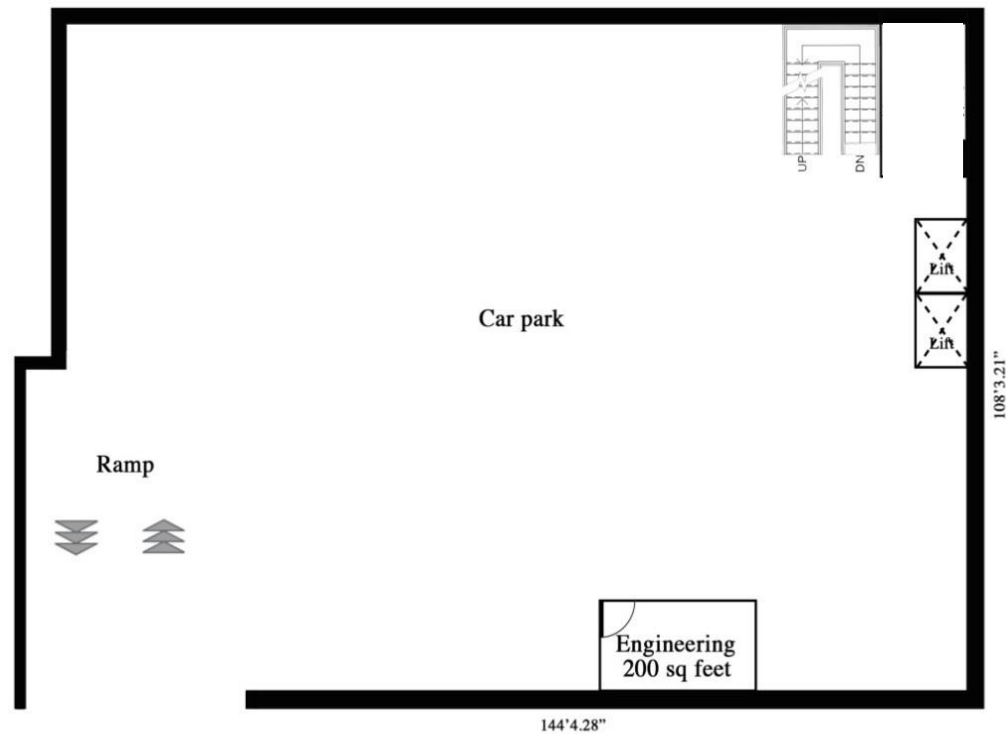
No. of admissions per annum= $27375/3 = 9125$

FLOOR WISE DISTRIBUTION OF FACILITIES

BASEMENT 2

CAR PARKING

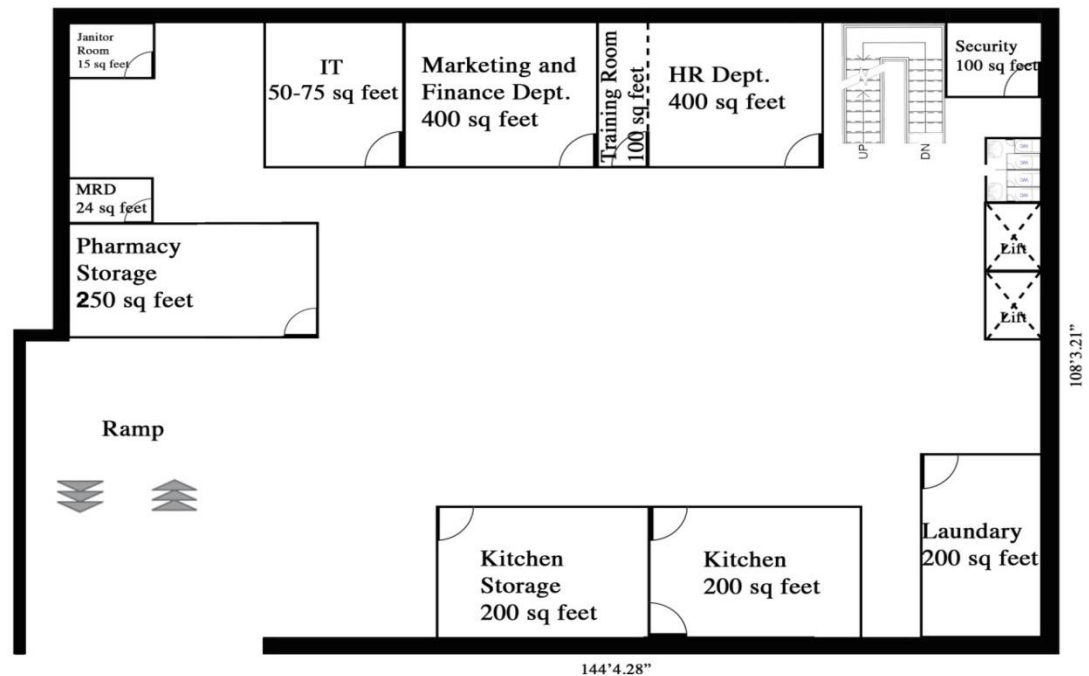
ENGINEERING DEPARTMENT



Basment 2

BASEMENT 1

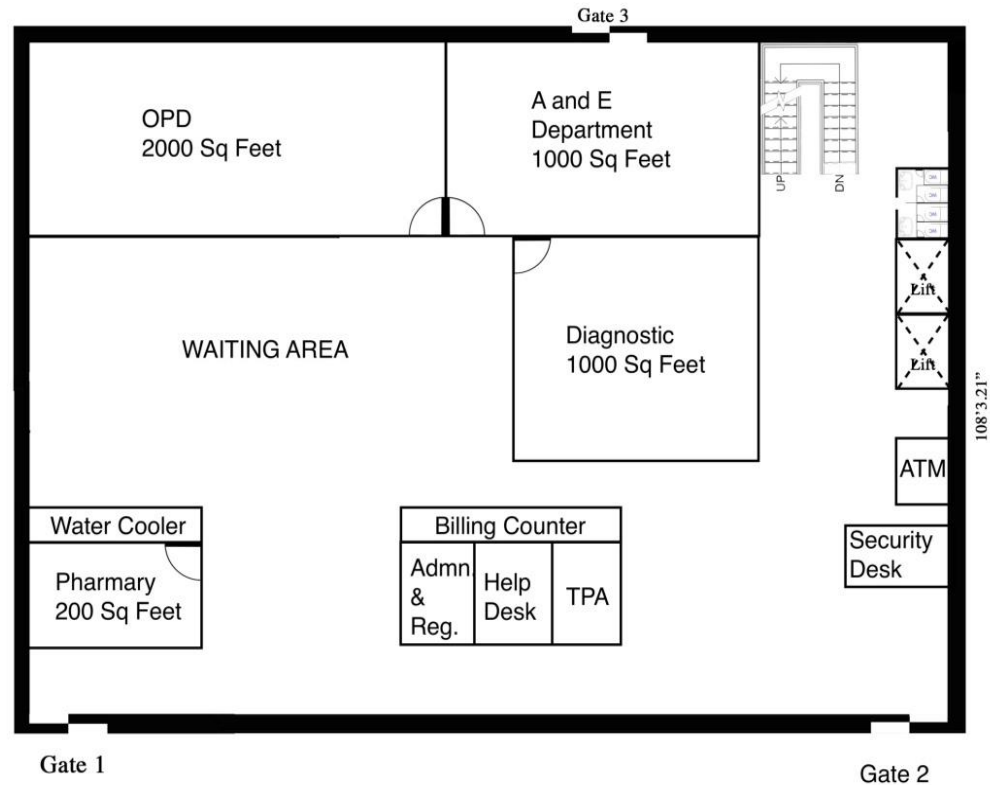
- HR DEPARTMENT
- MARKETING & FINANCE DEPARTMENT
- IT DEPARTMENT
- SECURITY DEPARTMENT
- PHARMACY STORAGE ROOM
- KITCHEN
- LINEN & LAUNDRY
- JANITOR ROOM
- MRD DEPARTMENT



Basment 1

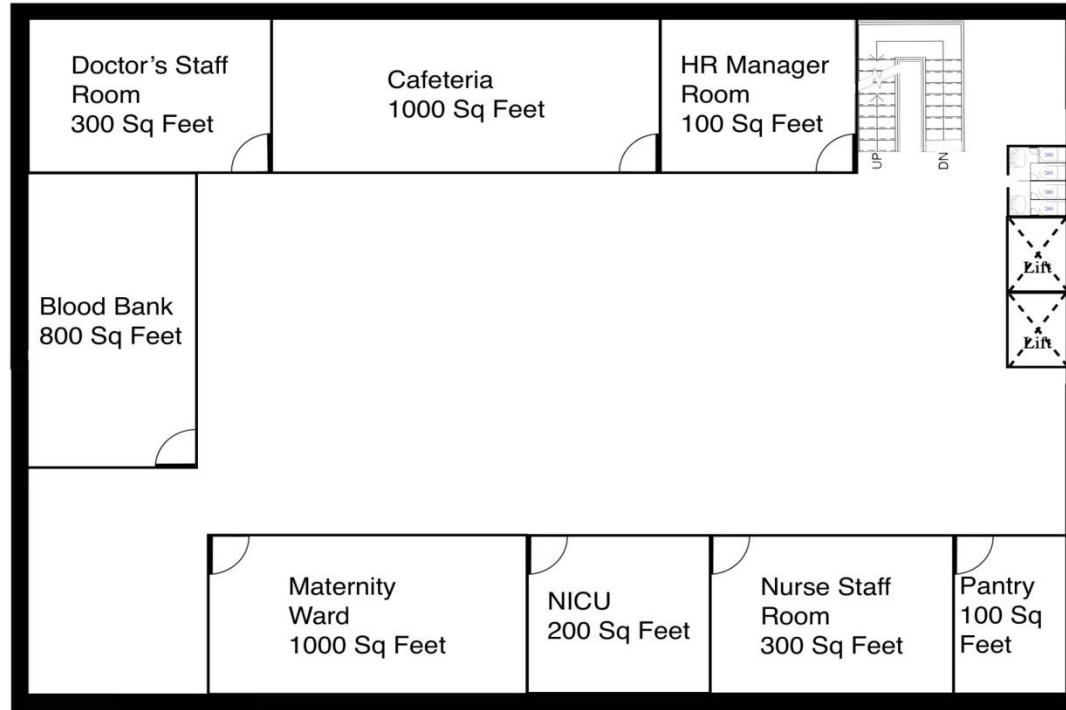
GROUND FLOOR

- A & E DEPARTMENT
- OPD CONSULTATION ROOMS
- DIAGNOSTIC SERVICES (LABORATORY & RADIOLOGY)
- BILLING COUNTER
- PHARMACY



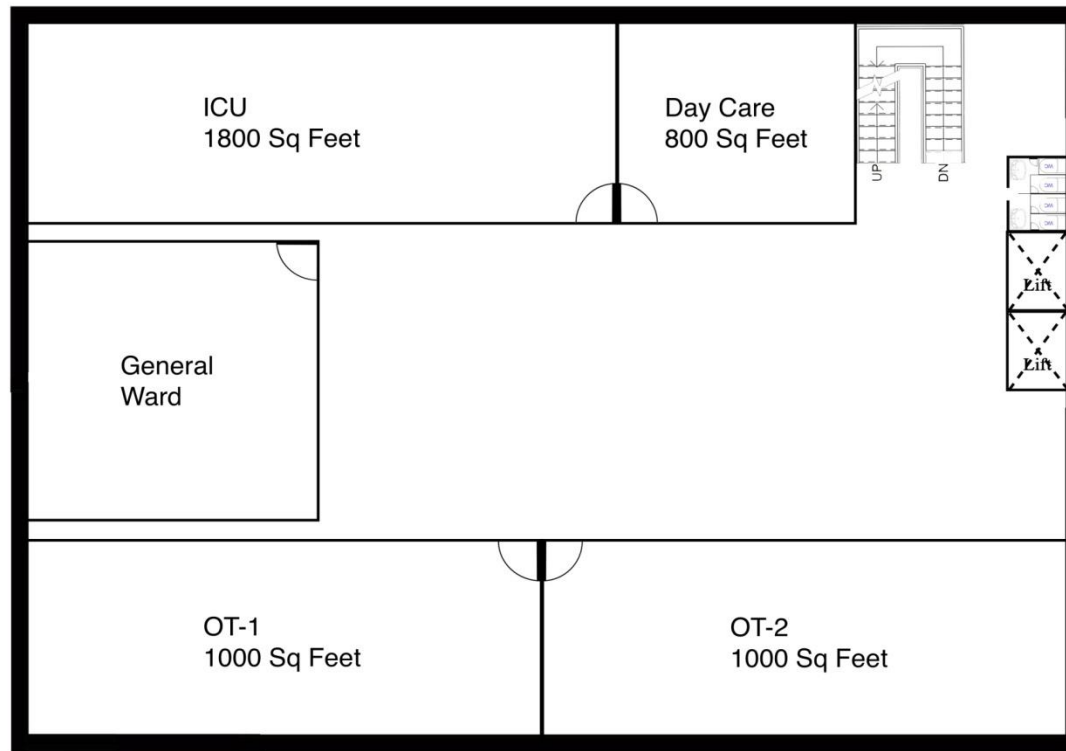
FIRST FLOOR :

- NICU
- Maternity Ward
- Doctor's Staff Room
- HR Manager Room
- Nurse Staff Room
- Cafeteria
- Pantry

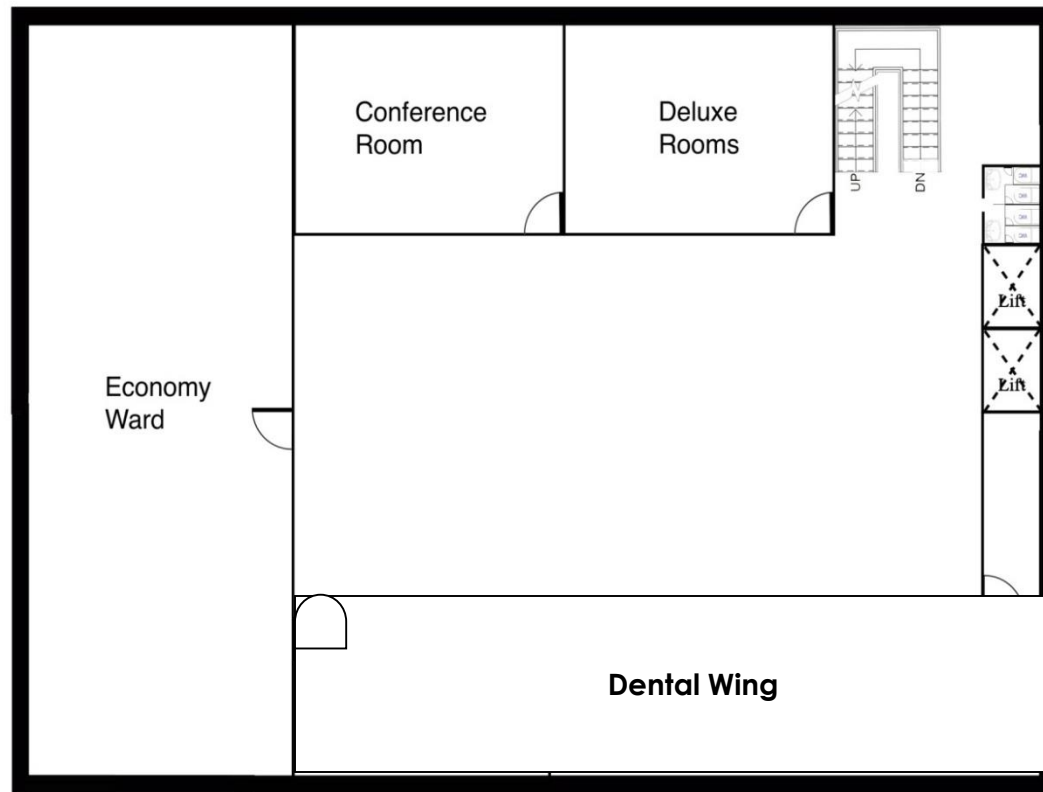


SECOND FLOOR:

- ICU
- Day Care
- General Ward
- OT Complex



Second Floor



DENTAL WING DESIGN

- We will be *making open operatory that would be identical*. This includes those to be used by the dental hygienist, as this provides for maximum flexibility of the clinic. This will help to eliminate the problem of health professionals using "favourite rooms" the majority of the time, which can have a negative effect on dental clinic efficiency.
- Placing windows in the operatories to facilitate the selection of tooth colour shades and to provide a pleasant atmosphere for patients and staff. North-facing windows are best, and East-facing are second best. Be cognizant of the exposure (when three people are in the operatory it can get warm quickly).
- The venting system will be planned so that there is proper air exchange in each operatory.
- The dental operatory will be setup, so that it is easily converted for use by either a right-handed or left-handed health professional.
- The laboratory should have a door, due to the noises and odors that originate there, and an exhaust fan.
- Provide adequate overhead lighting in the operatories to prevent eyestrain.
- Clinics must be able to provide care to patients with disabilities. Thirty-two inches is the minimum size for a space that will allow wheelchair access. Depending on the width of the side counters, this space is obtainable in the standard 10 foot by 11 foot operatory.

- Each operatory will be having sinks.
- Each operatory will access to an X-ray machine. (One X-ray head can be shared between two operatories if designed with a pass-through and permitted by state law.)
- The standard X-ray arm will extend to allow the far side of the patient's head to be 72 to 75 inches from the mounting point. This must be considered when locating the dental chair in the operatory.
- Plenty of electrical power points will be given for each operatory for future expansion.
- Providing a staff changing area, with lockers, within the dental clinic area. This will facilitate the separation of clothing used to treat patients from clothing that is worn outside of the clinic, which is important for infection control.
- The sterilization area will have a “dirty” and “clean” area to meet infection control guidelines.
- The construction of a new dental clinic requires careful planning to ensure that the resulting facility is functional and a pleasant place to work. Without proper planning, major and minor problems can occur during the construction phase. Dentists, unlike physicians (unless specialists), are locked into their environment. For a dentist to treat a patient, he or she uses extensive instruments and dental equipment that require fixed or semi-fixed plumbing and other built-in operating pieces and services. The plumbing services that will be installed are to facilitate the operation of water, compressed air, suction, a waste line, and electricity. The compressor and suction pump need to be isolated from the clinic due to the noise they make when operating. Sterilization, laboratory, darkroom, and reception will be located so as to allow the most efficient movement between them and the treatment rooms.

Operatory Layout

- The operatory final layouts must be based on the type of oral-health-care-delivery system and the brand that is selected for the clinic. It is best to have the operatory layout done by the manufacturer or dental supply company where the dental equipment is purchased.
- **Chair** - The adjustable seat in which patients receive treatment. Dental chairs installed will be hydraulically or electrically operated by foot controls or touch keypads. They can be positioned at every possible angle from fully upright to fully reclined. The major function of the chair is to situate the patient so that the oral health professional has comfortable, unobstructed access to the oral cavity from all angles.
- **Delivery Unit** - (also known as hand piece control). The suite of powered instruments used by the dentist. The instruments (hand pieces) comes attached to the moveable platform by flexible tubes containing air, water, fiber optic, and electrical lines. The delivery unit would be located at the side or the rear of the dental chair or can be mounted on the chair itself.
- **Operatory** - The dental treatment room. The simplest operatory layout containing a dental chair, stools for the dentist and his or her assistant, and a hand piece delivery system.

MAJOR PLANNING CONSIDERATIONS

- Operational work flow
- Occupational safety and Health
- Infection control
- Ergonomics
- Barrier Free Access
- Comfort
- Professional image
- Esthetic
- Infection control should be considered in the design stage of a dental department.
- Rectification work may be very difficult after operation of a dental department.

BASIC PRINCIPLES OF PLANNING A DENTAL DEPARTMENT

- **Zoning**- clean and dirty zones, clinical area and support area
- **Flows**- from clean to dirty
- **Simple**- to decrease contact surfaces
- **Seamless**- to avoid un-cleansable area
- **Smooth**- to allow easy disinfection
- **Durable material** able to withstand repeated disinfection

Zoning

- **Clinical area**-dental surgeries, sterilization room, x-ray room, recovery room.
- **Supportive area**-reception office, waiting area, server room, pantry, toilets.

BUILDING SERVICES

- Heating, Ventilation and Air Conditioning
- Fire services
- Water supply and drainage
- Electrical supply
- Compressed air and suction system

BUILDER'S WORK

- Ceilings
- Walls
- Floor
- Cabinets
- Doors

Humidity, ventilation and air conditioning

- Temperature: 22°C for clinical area(25.5°C for general offices)
- Relative Humidity: 50-60%
- Air Change per Hour (ACH): 2-6
- Air flow: from clean to dirty area
- Air Pressure: +ve for clean room, -ve pressure for dirty room e.g toilet

Water supply

- The quality of the water supplied by Water Supplies Department (WSD) conforms to the Guidelines for Drink-water Quality recommended by WHO.
- We will be putting into practice -
- Potable water supply for domestic use.
- Break tank (non-potable water) for clinical water supply for medical use, include dental unit, instrument sinks, autoclaves and film processor etc.

Drainage

- Standard gravity drainage system will be provided in general.

Electrical supply

- Emergency power supply may needed for normal functioning.
- 3 phase power supply for operator room.
- Dental clinics need 3 times electrical power supply

Quality requirement

- “The compressor will be fitted with an air-intake filter and a post compression filtration and dry system, to ensure that the air is clean and dry, minimizing the risk of contamination of the system by micro-organism.”

CEILING

- False ceiling with acoustic features to reduce the growth of fungus.
- Arranging the “air return” near the entrance to avoid dropping of dust over the clean area

WALLS

- Cleansable, smooth and anti-fungal.
- Non-VOC emulsion paint, vinyl sheet, compact board, or ceramic tiles
- Avoiding too much texture.

FLOOR COVERINGS

- All joins sealed.

CABINET

- Simple, smooth and seamless.
- Closed shelf.
- Drawers would be deep enough to enhance flexibility and placement of covered trays.

HAND WASHING BASIN

- 1 in every dental operator, not to share with instrument cleaning sink. \

DOORS

- Door knobs can serve as a fomite to indirectly transmit infectious organism
- Need regular disinfection

FUNCTION ROOMS

- Dental operator
- Central sterilization room (instrument reprocessing area)
- X-ray room and film processing area
- Laboratory

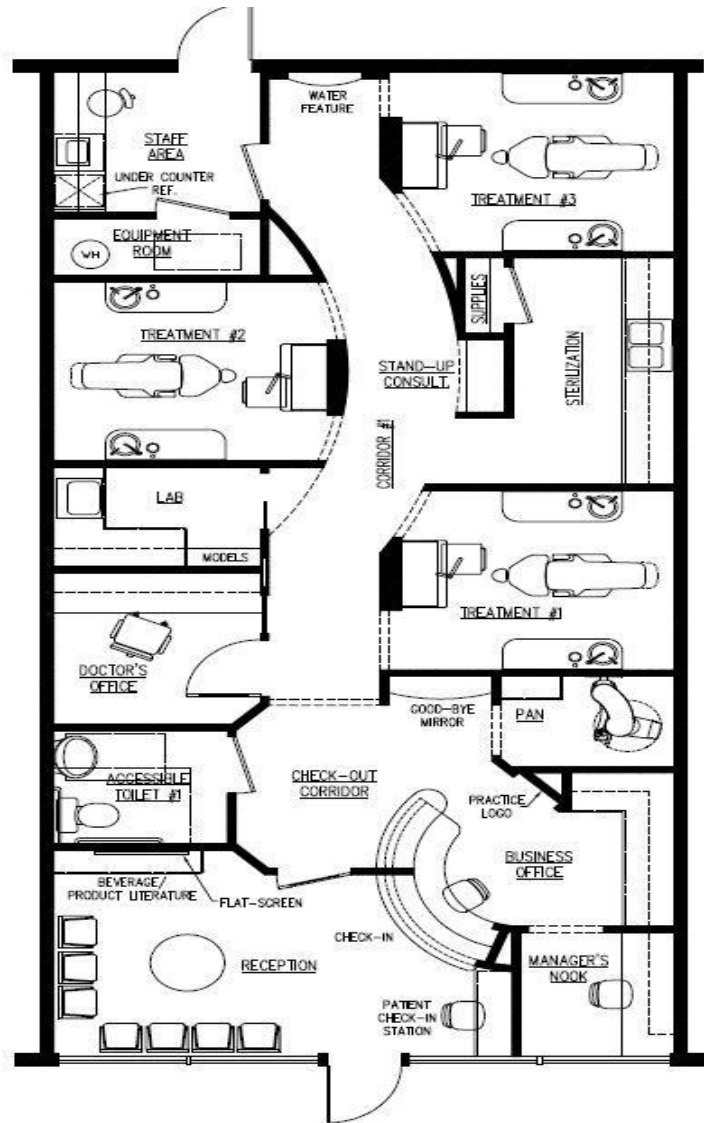
DENTAL OPERATORY

- Simplified cabinets to minimized contacts.
- Zoning would be clearly delineated.

STERILIZATION ROOM

- The central processing area should be divided into sections for
 - 1) receiving, cleaning, and decontamination;
 - 2) preparation and packing;
 - 3) sterilization; and
 - 4) storage

LAYOUT



CONCLUSION

- This report talks about the infrastructure upgradation, understanding infrastructure related requirements from the patient's point of view and from the provider's point of view.
- The detailed facility assessment helped in revealing a gaps in the infrastructure planning.
- Schematic layout of concept plans has been prepared subsequently in accordance with the recommended plan and space program.
- The Design plans would incorporate the best practices in healthcare facility design including patient friendly infrastructure and nationally accepted safety protocols.

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