

**Scheme for Strengthening of District Hospitals and the
Creation of District Hospital and Knowledge Centres
(DHKCs)**

Draft Concept Note

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1. CONTEXT OF THE SCHEME

In our country a district is the basic administrative unit for revenue, police, health, education and other miscellaneous functions of Public Administration. For delivery of health services in a district, a hierarchy of public health institutions -- Primary Health Centres, Community Health Centres, Sub-district / Taluka Hospitals and District Hospital have been created. Other than these facilities there are outreach services delivered from health sub-centres and Anganwadi Centres and community health workers. District is also the unit from which health education, preventive and promotive health programmes are managed. Finally the district is also the unit where epidemiological and service delivery information is analysed and used for public health action.

The average district in India is large and ranges in the 20 lakhs population range. In the country there are 632 districts¹ and approx 596 district level health facilities. Population of a district and population density within state vary considerably, (see annexure 1) and this has direct bearing on the planning for the services and their utilisation. At one end of the spectrum, we have district of Thane in State of Maharashtra having population of approx. 1.11 crore and North Paraganas with 1.10 crores population, while at the other end of spectrum is formed by Arunachal Pradesh's Dibang Valley District, which has population of 7,948. States also vary widely in average size of population per district. A summary of population distribution in the districts is given below –

Sr. No.	Population of Districts	No. of Districts
1	Less than 10 lakhs	195
2	> 10 lakhs to 20 lakhs	214
3	> 20 lakhs	231
	Total	640

**Details of Population per district of all states is annexed as Annexure-A*

In the states where districts are large, there is a case for using the block as the unit of such planning. However, in precisely these states, block level capacities are very limited and even organising the district as the unit of public health management is a challenge.

The District Hospital plays a major role in this context where the district is the most effective unit of public health management. It has been perceived as the apex delivery point of health services in a district with only the Medical College Hospitals above it. Bhore Committee in its path-breaking "**Report of the Health Survey and Development Committee**" in 1946 had made following recommendations for district hospitals, which even after passage of half century is relevant – "*The Provision of Medical Relief at District Headquarters is, as may be expected is on much larger scale than at the secondary care unit hospital. The number of beds in the district hospital will be 2,500 and the numbers of medical officers and other personnel, employed will be proportionately larger than in a secondary unit hospital*".

2.

Post-independence era was followed by administrative reforms and reorganisation of the states and districts. Since then large number of new districts have also been created and all of these had a district hospital sanctioned, often by upgrading of the existing health facilities to district level facilities in the newly created district headquarters. At few locations, existing district hospitals have been subsumed into newly created medical college hospitals.

There are also been other major changes in the health care scenario. These could be listed as follows

- a. There is much greater burden of non communicable diseases now. Deaths due to trauma, cardiovascular diseases, metabolic disease and cancers have become leading contributors to current death rates.
- b. Deaths due to maternity and deaths and infancy are much reduced, but high in international comparisons. The last mile in reaching international standards of maternal and child survival requires a much higher level of facility based and technology intensive management. Changing Pattern of Diseases - e. g. Diabetes Mellitus,

¹ Source: <http://india.gov.in/knowindia/districts.php>

² Source: <http://www.census2011.co.in/district.php>

Trauma cases, Malignancy, HIV/ AIDS, Resurgence of previously controlled infection – Tuberculosis, Malaria, Emergence of Microbial resistance, etc

- c. Newer technologies require much greater organisation, skill levels and expenditures. This includes both diagnostic tools and treatment modalities.
- d. There is a much greater expectation from communities both in range of services and quality of care. As the population ages, and undergoes an epidemiological and demographic transition, while social security systems have remained underdeveloped, it becomes a challenge both in terms of organisation and in terms of finances to meet these expectations.
- e. The cost of care has increased tremendously, partly related to the factors listed above, but also due to restricted public expenditure and expansion of services, with a runaway often irrational and unregulated expansion of the private sector. Thus the private sector in modern medicine's share of total expenditure on health care has risen from 8% at the time of independence to almost 80% now. Private expenditure in India accounted for 67% of the total expenditure on health - comparatively higher than in Thailand (24%), China (50%) and Sri Lanka (56%). Two features of private out-of-pocket spending are important to note. Of this high out-of-pocket expenditure, Outpatient treatment, and not hospital care, accounts for 74% of private out-of-pocket expenditures and further that medicines account for 72% of the total private out-of-pocket expenditure.
- f. Governments have launched a number of schemes to purchase private care with public financing. The most extensive and successful of these relate to insurance mechanisms. However one of the problems that such schemes face is to find providers of care in a geographically dispersed manner that are willing to provide services at costs which viable and sustainable insurance schemes are willing to reimburse. In many district contexts, only the district hospital is available to play this role. Public hospitals have the incentive to treat beneficiaries under RSBY as the money from the insurer will flow directly to the concerned public hospital which would make not only for a more responsive financing of the facility, but also for increased incomes to providers.
- g. For outreach services and primary health care services, one of the critical inputs needed is for appropriately skilled human resources. International and national experience shows, that candidates selected from the same locality, and trained in institutions within the same socio-cultural milieu and with appropriately modified curriculum is one of the best ways to address the problems of attracting and retaining skilled providers where they are needed most. The district hospital has thus become the preferred site for both in-service skill building and for pre-service educational programmes which are focussed on developing skilled service providers for service within the same district. Since such training programmes require adequate patient case loads to be effective as teaching sites, only the district hospital is currently in a position to provide this. Pre-service training programmes would include nurse training programmes- ANM, GNM and B.Sc, paramedical training programmes, three year medical courses if they are constructed and even medical courses if the hospital is large enough and the faculty is available. The first priority of these institutions is to provide skilled professionals for working in public service within the same region. One corollary of such a wide role in training is for the district hospital itself to have the best quality of clinical care practices.
- h. District hospitals also provide the referral care and support that is needed for primary health care to have credibility. If antenatal care picks up a pregnant woman with life threatening complications, there must be a place where she could be confidently referred to. Else all of ante-natal care loses its credibility. In management of most chronic diseases most of the case prevention and management activity can occur at the primary care level, but only after a specialist consultation and a higher technological level of investigation is carried out prior to initiating treatment. The district health care system thus acts as a single unit, with the district hospital as the central knowledge node.
- i. For public health purposes, also the district hospital has the technical resources in terms of laboratories and skills to diagnose disease outbreaks and provide inputs for district level planning, data analysis and management etc. The district hospital should also serve as a model for the quality of care with respect to patient amenities, patient safety and hospital management practices.

Current Scenario with respect to district hospitals.

The current scenario in district hospitals is far from ready to play this role. At present, a large number of district hospitals are faced with many issues, which cuts across the states and geographical locations. Few common examples are given below –

A. District Hospital as Clinical Care Provider:

1. Service Delivery
 - a. Limited range of services- many essential communicable and non communicable diseases cannot be diagnosed and treated in the district hospital. The ideal is that over 90% of morbidity types should be treated within the district hospital
 - b. MCH Services, non availability of emergency obstetric services and intensive pediatric care unit.
 - c. Non-linkage for referral services
 - d. High out of pocket expenditures
 - e. Hospital Infection control measures. Hand washing, sterilization, fumigation, etc.
 - f. Privacy of patients, hygiene and cleanliness, staff- patient relationships.
 - g. Absenteeism among doctors and staff. Lack of commitment, motivation, leadership and sense of ownership
 - h. Lack of Quality Improvement Programme
2. Human Resources
 - a. Lack of Specialists
 - b. Lack of adequate numbers of supportive medical officers/residents
 - c. Lack of qualified staff nurses
 - d. Lack of other supportive paramedical staff.
 - e. Lack of other supportive workers- or contracting arrangements for the same.
3. Infrastructure -
 - a. Non-availability of space – After launch of JSSY, coupled with IEC& BCC interventions on promoting institutional deliveries, have resulted into very high demand generation of the hospital services, which the hospitals not able to meet
 - b. Non-availability of ICU, NICU, SNCU, etc
 - c. Non-functional Accident & Emergency Department, more so during OPD hours
 - d. Lack of basic amenities-safe drinking water, clean toilets, sitting arrangements and waiting area
4. Drugs & Equipments
 - a. Non-availability of Essential Drugs and poor stock and supply side management.
 - b. Non-availability of equipments or of Equipment Maintenance plans
5. Ancillary Services
 - a. Poor hygiene & sanitation
 - b. Poor Fire safety compliance in term of availability of appliances, signage of escape route, conduct of practice-drills, etc
 - c. Inadequate supply of linen and laundry services
 - d. Safety and security of patient, visitors and staff
 - e. Non provision of diets, as per patients' requirement
 - f. Biomedical waste of management - availability of colour coded bins, functional needle destroyers, and disinfectants, Lack of awareness & training
 - g. Non- existent Medical Records Department
6. Preparedness of hospitals for Disaster Management as per NDMA guidelines
7. Poorly administered contracts and services, out-sourced under PPP arrangement
8. Compliance to statutory and legal compliances

B. Educational and Training Role of District Hospital

- a. Lack of demonstration rooms , class rooms, lecture theatres,
- b. Lack of hostels, guest rooms
- c. Lack of teacher training skills and methodologies
- d. Lack of faculty /trainers in many areas.

C. Referral and Public Health Support role of District Hospital.

1. Lack of electronic and telemedicine linkages with peripheral facilities, and capacity to share information of public health nature or medical records.
2. Lack of adequate laboratories.
3. Lack of adequate skills in public health and data analysis.

In order to address, above mentioned issues and concerns, it is proposed to launch a scheme for strengthening of District Hospitals in the country.

2. GOALS & STRATEGIES OF THE SCHEME:

1. Create the number of hospital beds in the public sector required for serving the clinical care needs of district population. (Note: The Working Group on '*Progress and Performance of National Rural Health Mission and Suggestions for the Twelfth Five Year Plan (2012 – 2017)*' has recommended that the number of primary and secondary care beds required in the district should be based on population and epidemiological norms with the option for the district plan to distribute these beds between the various facilities- block PHCs or CHCs and SDH and DH. For a 10 lakh district population, a minimum of 500 beds is required taking all these facilities together. WHO norms are 1500 beds for 10 lakhs- but given both private sector presence and also limited public sector capacity- a 500 bed per 10 lakhs starting point as a baseline for all districts. Of these about 300 beds would be in the CHCs and SDH so as to give a more distributed access to secondary care services but the DH would start with at least 200 beds for a 10 lakh population. Note: The 4 to 6 beds in the sector PHC are largely day care beds and for institutional delivery and stabilization care and the group felt that these beds are not to be counted either for reaching norms of bed creation or later in bed occupancy calculations).
2. Develop the district hospital with the complement of human resources and infrastructure and supportive processes needed for it to serve six roles which together define the District Hospital and Knowledge Center (DHKC)
 - a. Provide all secondary and considerable elements of tertiary care required- so that most morbidities find adequate care within the district itself.
 - b. Provide adequate referral support for clinical care at primary care levels.
 - c. Act as the preferred site for skill based in-service training
 - d. Act as the clinical site for a nursing school and college, for paramedical education programmes and for a diploma/degree in public health and/or the three year rural medical assistant programme.
 - e. Act as a resource support and institutional memory for district planning and data management and analysis.
 - f. Provide laboratory support for public services.

3. Services at the District Hospital:

For a transformed District Hospital which could meet majority of the health requirements of the community at district level, following services may be planned: This could be modified/adapted to the needs of each specific district.

- A. Services include OPD, indoor, emergency services (Minimum assured essential services)

B. Secondary level health care services and Tertiary care services (optional) regarding following specialties will be assured at hospital:

I. Consultation services with following specialists:

- | | |
|---|---|
| i. General Medicine. | ii. General Surgery. |
| iii. Obstetrics & Gynaecology | iv. Paediatrics including Neonatology |
| v. Emergency (Accident & other emergency) and Critical care | |
| vi. Anaesthesia | vii. Ophthalmology. |
| viii. ENT | ix. Dermatology & Venerology |
| x. Orthopaedics. | xi. Dental Care |
| | xii. Psychiatry |
| | |
| Optional | |
| xiii. Cardiology | xiv. Cardio-thoracic & Vascular Surgery |
| xv. Urology | xvi. Nephrology |
| xvii. Neurosurgery | Gastroenterology |
| xviii. Oncology | |

II. Diagnostic and other Para clinical services regarding:

- i. Laboratory services
 - Biochemistry
 - Haematology.
 - Microbiology
 - Histopathology.
 - Other clinical Pathology.
- ii. ECG, Echocardiogram.
- iii. Blood Bank.
- iv. Physiotherapy and Rehabilitation.
- v. Medico-legal/post-mortem- forensic
- vi. Drugs and Pharmacy
- vii. Counselling services for domestic violence, gender violence, adolescents, etc
- viii. Radiology services
 - X-Ray
 - Ultrasound.
 - CT scan.
 - MRI (optional)

II. Ancillary and support services:

- | | |
|--------------------------------------|--|
| i. Ambulance services | ii. Dietary services |
| iii. Laundry services | iv. Security services |
| v. Waste management | vi. Ware housing/central store |
| vii. Maintenance and repair | viii. Electric Supply (power generation and stabilization) |
| | x. Heating, ventilation and air-conditioning |
| ix. Water supply (plumbing) | xii. Communication |
| xi. Transport | xiv. Horticulture (Landscaping) |
| xiii. Sterilization and Disinfection | xvii. Cold chain management |
| xv. Lift and vertical transport | xviii. Housekeeping and Sanitation |
| xvi. Quality Assurance. | |

III. Administrative Support Functions:

- i. Medical records (Provision should be made for computerized medical records)
- ii. Inventory Management
- iii. **Quality Management System:** To improve quality of services and reduce out of pocket expenditure. All the District Hospitals should achieve Quality Certification, as per desired standards (IPHS/state developed standards/NHSRC propounded ISO system/NABH/JCI etc.).

iv. Public Health Services:

Public health managers (2), Epidemiologist, Medical entomologist,(optional), microbiologist, data management and analysis or health informatics specialists, and public health administrator, hospital manager,

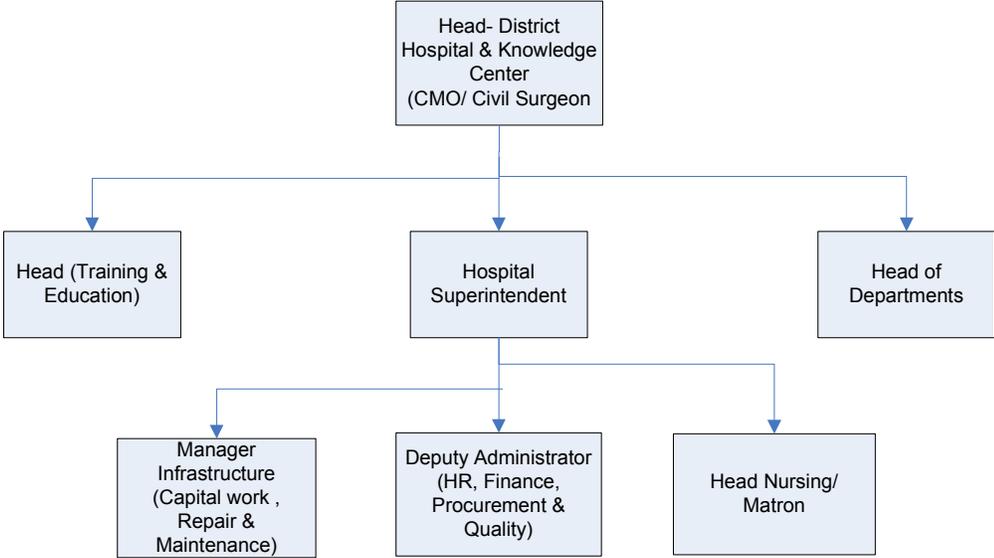
v. Education and Training:

Nursing Tutors. Paramedical course instructors, heads for nursing and for paramedical training programmes. Training: Plans, Providers, and Support: Proper Training Room and Equipment, hostels, class rooms and guest rooms.

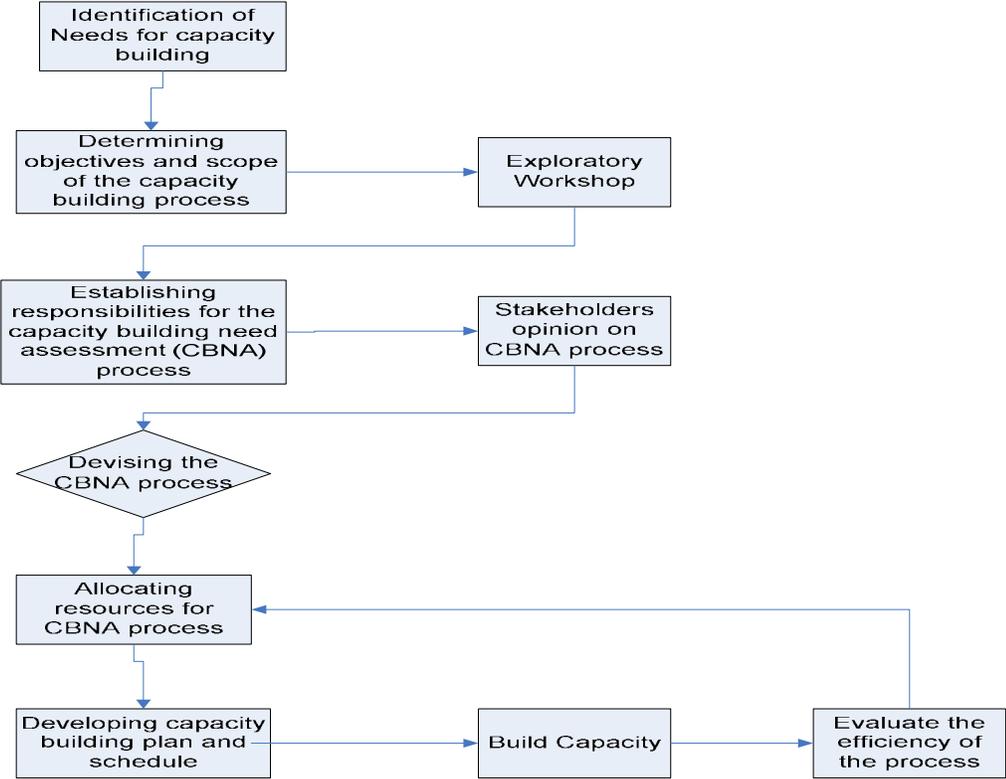
- vi. Strengthening of Hospital Management Information Systems (HMIS)
- vii. Enhancing Disaster preparedness and Disaster Management capacity -
- viii. Addressing issues of Patient Safety –
- ix. Telemedicine Centre –

4. INSTITUTIONAL ARRANGEMENT

ORGANOGRAM



Flow Chart Showing Capacity Building Need Assessment



Proposed strengthening of District Hospitals would be taken as per following arrangements –

- a. **State Hospital Cell** – The State would form a State Hospital Cell, which would have requisite knowledge and expertise to provide technical support for strengthening of Health Facilities in the State. The state should appoint adequate number of Hospital Planners, Hospital Architects and Civil Engineer. If the quantum of work is large, the state may consider appointing a structural engineer and one electrical engineer. The services of Structural Engineer and Electrical engineer could be out-sourced, if so felt by the state.
- b. **Fund – flow** – The fund flow for the strengthening of District Hospital would be through flexi-pool financing under the NRHM.
- c. **Development of Hospital Development Plan** – The State should develop a composite facility development plan for each District Hospital, which should have at least 10 years futuristic timeframe. Since resource allocation would be a constraint and release of funds would take place every year, the Hospital Development Plan would have a realistic and time bound activities, which are to be completed every year.

Average population per district.

	Population – Census - 2011	No of Districts	Average population/district/state
INDIA	1,210,193,422		
West Bengal	91,347,736	19	4,807,776
Andhra Pradesh	84,665,533	23	3,681,110
Maharashtra	112,372,972	35	3,210,656
Uttar Pradesh	199,581,477	71	2,811,007
Bihar	103,804,637	38	2,731,701
Kerala	33,387,677	14	2,384,834
Gujarat	60,383,628	26	2,322,447
Tamilnadu	72,138,958	32	2,254,342
Rajasthan	68,621,012	33	2,079,425
Karnataka	61,130,704	30	2,037,690
NCT of Delhi #	16,753,235	9	1,861,471
Madhya Pradesh	72,597,565	50	1,451,951
Chhattisgarh	25,540,196	18	1,418,900
Orissa	41,947,358	30	1,398,245
Punjab	27,704,236	20	1,385,212
Jharkhand	32,966,238	24	1,373,593
Haryana	25,353,081	21	1,207,290
Assam	31,169,272	27	1,154,417
Chandigarh #	1,054,686	1	1,054,686
Tripura	3,671,032	4	917,758
Uttarakhand	10,116,752	13	778,212
Goa	1,457,723	2	728,862
Himachal Pradesh	6,856,509	12	571,376
Jammu & Kashmir	12,548,926	22	570,406
Meghalaya	2,964,007	7	423,430
Dadra & Nagar Haveli #	342,853	1	342,853
Puduchery#	1,244,464	4	311,116
Manipur	2,721,756	9	302,417
Nagaland	1,980,602	11	180,055
Sikkim	607,688	4	151,922
Mizoram	1,091,014	8	136,377
Andaman & Nicobar Islands	379,944	3	126,648
Daman & Diu #	242,911	2	121,456
Arunachal Pradesh	1,382,611	16	86,413
Lakshadweep #	64,429	1	64,429

INFRASTRUCTURE STRENGTHENING

At present, availability of beds in India is approx. 0.9 beds per 1,000 populations. There is an urgent need to increase number of beds in public health facilities, more so in District Hospital facilities.

Size of the hospital:

The size of a district hospital is a function of the hospital bed requirement, which, in turn is a function of the size of the population it serves.

Data collected³:

Population of district - 10,00,000

Average length of stay in hospital - 5 days

Annual rate of admissions - 1 per 20 population (this may vary from district to district)

Computations:

(1) Total number of admissions per year:

= district population x rate of admission per year = 10,00,000 x 1/20 = 50,000

(2) Bed-days per year:

= total number of admissions per year x average length of stay in hospital

= 50,000 x 5 = 2,50,000

(3) Total number of beds required when occupancy is 100%:

= bed-days per year / 365 days = 2,50,000 / 365 = 684.93, say 685 beds.

(4) Total number of beds required when occupancy is 80%:

= bed-days per year / (365 x 80%) = 2,50,000 / (365x80%) = 856.16, say 850 beds

Currently IPHS recommendations are about 200 beds per ten lakhs population. The remaining 650 beds could be distributed in the CHCs and SDHs. We can take this as a minimum and design the hospital such that further 200 beds can be added on if bed occupancy reaches

Area of the hospital:

To initially determine the total area of the hospital, the number of beds must be multiplied by a factor or a standard expressed in area per bed. This factor has been discussed at various meetings of the hospital planning and design in the WHO Western Pacific Region and, based on the opinion expressed by various countries, a figure of 40 sqm/bed has been found to be reasonable. However, it can be changed according to the actual situation prevailing at a particular site/location.

Computations:

(5) Total area of hospital:

= total number of beds x 40 square metres per bed

= 500 beds x 40 = 2000 square metres (for 100% occupancy)

This method gives an initial picture of the physical size of the hospital, which in turn can be used to determine initial budgetary costs through the application of prevailing construction costs per square metre.

Using this approach, the number of "justified" admissions must be estimated on the basis of the existing level of admissions, corrected according to a population survey to determine the number of people who needed hospitalization but could not be admitted and to a hospital audit that showed how many patients had been hospitalized

³ Source: WHO - http://www.wpro.who.int/internet/files/pub/297/part1_1.1.pdf (accessed on 27th Dec 2011)

In the already existing structures of a district hospital

- It should be examined whether they fit into the design of the recommended structure and if the existing parts can be converted into functional spaces to fit in to the recommended standards.
- If the existing structures are too old to become part of the new hospital, could they be converted to a motor pool, laundry, store or workshop or for any other use of the district hospital.
- If they are too old and dilapidated then they must be demolished. And new construction should be put in place

Functional area of hospital:

The entrance area will consist of three entrance zones namely: Main entrance for OPD, diagnostic and therapeutic services, IPD/Emergency entrance for intermediate, critical and emergency care, Entrance for engineering services, hospital supplies and staff entry.

Allocation of Bed strength at various levels (for 200 beds):

Department	Beds	Remark
General Medicine	30	M+F
New born ward	5	
Pediatrics ward	10	
Critical care ward	5	
Isolation Ward	4	
General surgery ward	30	M+F
Post – Operative Ward Beds	10	
Accident and Trauma ward	10	
Ante-natal ward Beds	15	
Postpartum ward Beds	30	
O&G ward	30	
Post operative ward Beds	16	F
Ophthalmology ward Beds	5	

Illumination⁴ –

Illumination level of different departments of shall be as per BIS (Bureau of India Standards) standards (IS 4347-1967, Code of practice for hospital lighting). The recommended illumination levels are:

S. No.	Department	Illumination (lux)
1.	Reception and waiting room	150
2.	Wards	
2.a.	General	100
2.b.	Beds	150
3.	Operation Theatre (General)	300
4	Laboratories	300
5.	Radiology	100
6.	Casualty and Outpatient Departments	150
7.	Stairs and corridor	100
8.	Dispensaries	300

⁴ IS 4347-1967 Clause 10.

Hospital water Requirements⁵

- a. Hospital (Including Laundry)
 - i. Category A & B (25 to 100 Beds)- 350 litres per bed per day
 - ii. Category C(101 to 30 beds)- 400 Litres per bed per day
 - iii. Category D & E(301 to 750 beds)- 450 litres per bed per day
- b. Hostels- 135 litres /head /day

Hospital Department wise requirements-

a. Out Patient Department (OPD)

Space Requirements-⁶

- Doctor chamber should have ample space to sit for 4-5 people. Chamber size of 12.0 sq meters is adequate.
- Waiting area at the scale of 1 sq ft per average daily patient with minimum 400 sq ft of area.
- Ramp shall be provided with a gradient of 1:20 for physically challenged patients / visitors.⁷
- One toilet each for males and females to be provided for first 200 patients and / or visitors followed by one each for every 100.³

Patient Department (IPD)- ⁸

Ward-

- I. Area – 7 sq meters per bed.
- II. Distance between centres of two beds – 2.25 meter
- III. Clearance from wall – 200 mm

Sanitary Requirements –

1.	Water Closet	1 for every 8 beds (male) 1 for every 6 beds (Female)
2.	Ablution Taps	1 for each water closet plus 1 water tap with drainage arrangement in the vicinity of water closet.
3.	Urinals	1 for every 12 beds (Male Only)
4.	Wash Basin	1 for every 12 beds
5.	Baths	1 bath with shower for every 12 beds
6.	Bed pan washing sink	1 for each ward in dirty utility and sluice room
7.	Cleaner's sinks and sinks/ slab for cleaning mackintosh	1 for each ward in dirty utility and sluice room
8.	Kitchen sinks	1 for each ward in ward dishwashers pantry

⁵ IS 10905(part3)-1984)

⁶ Principals of Hospital Administration, Dr. McGibony

⁷ IS 15461:2004

⁸ IS 12433 (Part 2) : 2001

Nurse Staffing Norms⁹

- 1 Nurse for 6 beds for General Ward
- 1 Nurse for 4 beds Special ward
- 1 Nurse for 1 bed for ICU
- 2 Nurse for one major OT Table
- 1 Nurse for one minor OT Table
- 1 Nurses for one Labour table
- Casualty- 1 Nurse for per shift (up to 100 patient), then 1 nurse for every additional 35 patients
- 1 Nurse for 2 burn ward beds
- 1 Nurse for a 40 OPD Patients
- Add - 45% leave/ training/ sickness reserve

Labour Room-

Labour rooms should preferably be in the form of cubicles, two labour rooms for every 10 maternity beds. The labour rooms should be placed adjacent to delivery rooms. The examination-cum-preparation room and labour room may be combined into a single room. Labour room should have floor space at least 18 square meters.¹⁰

f. Diagnostic Services-

Clinical Laboratories –

- I. Space Requirements – 1 sq ft /25-30 yearly tests. ¹⁵
- II. To avoid crowding at laboratory, a specimen collection centre should be opened at OPD, if the main laboratory is located in a separate building/ floor.

X-Ray¹¹

Structural Requirements – *As per AERB (Atomic Energy Regulatory Board) guidelines and manufactures recommendations*

Central Sterile Supply and store unit (CSSD):

As a general guide for a Hospital of up to 400 beds, area of 1.40 sq. m/bed ¹²will be required for CSSD. For a Hospital with >400 beds, area of 1 sq. m/bed will be sufficient.

Mortuary Services

Size¹³

For a hospital of 50-100 beds, mortuary refrigerator should have a capacity to hold two bodies. For a 200 bedded hospital, at least three body capacities should be provided. Teaching and research hospitals require larger capacity refrigerators according to their need.

⁹ Staff Inspection unit (SIU) 1991-92, Indian Nursing Council

¹⁰ IS 12433 (Part 2) : 2001

¹¹ AERB Guidelines

¹² IS 15461 : 2004

¹³ Principals of Hospital Administration, Dr. McGibony

INFRASTRUCTURE REQUIREMENT FOR KNOWLEDGE CENTRE:

S.NO	FACILITY	NUMBER	AREA (Figures in sq ft.)
1.	Lecture Hall	4	@ 1080= 4320
2.	Laboratories (clinical)	5	@900=3600
4.	Computer Lab	2	@1500=3000
5.	Multipurpose hall	1	3000
6.	Common room(male and female)	1	2000
7.	Staff Room	1	1000
10.	Library	1	2400
11.	A.V. Aids Room	1	600
13.	Faculty room	10	2400
14.	Provision for toilets	4 (M+F)	1000

HOSTEL BLOCK-

S.NO	HOSTEL BLOCK	NUMBER.	AREA (in Sq.Ft)
1.	Single room with attached toilets.	10 @1400 sq feet	84,000
	Double room	60=20 (M)+40 (F)@1400 sq.feet	
3.	Visitor room	1	500
4.	Reading room	1	250
5.	Store	1	500
6.	Recreation Room	1	500
7.	Dining hall	1	3000
8.	Kitchen and stores	1	1500

*Proportionately the size of the built-up area will increase according to the number of trainees.

Cost Estimate for Infrastructure Development per Bed for District Hospital

Departments	Floor Area Required (sq mt)	Cost of Construction	Cost of Fire Fighting	Water Supply & Sanitary Installation	Electricity Installations /Furniture/Fixtures	Total
General Ward	22.1	318292	9923	31829	63658	423702
Diagnostic Services	8.3	90797	3749	9080	18159	121785
Emergency	6.6	94780	2955	9478	18956	126169
Therapeutic Area (OT, Delivery Suit)	12.3	162935	5513	16294	32587	217328
Hospital Services kitchen, CSSD, laundry, Stores, Mortuary	9.8	106820	4410	10682	21364	143276
Engineering Services-	5.5	59819.2	2469.6	5981.92	11963.84	80234.56
Administrative/ Ancillary Services	6.3	68364.8	2822.4	6836.48	13672.96	91696.64
Total	83.8	1045113.56	37705.5	104511	209023	1396353

Assumptions/ Standards Referred-

1. Space Requirements per bed are taken as per "IS 12433(Part2):2001- Basic Requirements for Hospital Planning".
2. 40% circulation area have been included in the as per "IS 12433(Part2):2001- Basic Requirements
3. Cost for developing Infrastructure is calculated as per Plinth Area Rates 2010 published by CPWD.
4. Additional Rs. 1235 per sq meter have been added in clinical areas as per CPWD guidelines.

Human Resource Planning for District Hospital and Knowledge Centre

For optimum functioning of 200-bedded district hospital, following personnel would be required –

Sr no.	Specialist	Proposed Strength for 200 bedded hospital
I. DOCTORS		
1.	Medicine (General Physician)	2
2.	Surgery	2
3.	Obstetrician & Gynaecologists	3
4.	Paediatrician	3
5.	Anaesthetist	2
6.	Ophthalmologist	1
7.	Orthopaedics	1
8.	Radiology	1
9.	Pathology	1
10.	ENT Specialist	1
11.	Dental	1
12.	MO	13
13.	Dermatologists	1
14.	Psychiatrist	1
15.	Microbiologist	1
	Sub-Total	34
II. Nurses		90
III. Paramedical Staff		41
IV. Administrative Staff		12
TOTAL		178

Categories of Paramedical Staff -

	Cadre	Number
1.	Lab Tech	9
2.	Pharmacist	6
3.	Storekeeper	1
4.	Radiographer	3
5.	ECG Tech/Eco	2
6.	Ophthalmology Assistant	1
7.	Dietician	1
8.	Physiotherapist	1
9.	OT. technician	6
10.	CSSD Asst	1
11.	Social Worker	3
12.	Counsellor	1
13.	Dental Technician	1
14.	Darkroom Asst.	3
15.	Rehabilitation Therapist	1
16.	Biomedical Engineer	1
	Sub-total	41

Hospital Administration Staff¹⁴

Sr No	Cadre	Number
1.	Hospital Administrator	1
2.	Housekeeper/manager	2
3.	Medical Records officer	1
4.	Medical Record Asst.	2
5.	Accounts/Finance Asst.	3
6.	Accounts Officer	1
7.	Office Asst.	2
	Sub-total	12

¹⁴ Ambulance, Cleaning, Kitchen, Laundry and Security Services may be outsourced. If hospital decides to have these services in-house, number of administrative staff would increase accordingly.

The district hospital is expected to function as 'District knowledge centre' as well. Therefore, for the responsibilities, other than providing curative services, the hospital would have following personnel –

1. IT Administrator (for telemedicine centre and Intranet within the hospital)
2. Data Analyst
3. Training Coordinator

Personnel, required at the affiliated training institutions are as follows -

Norms for ANM TC

(For annual intake of 30 ANMs)

POST	NUMBER	QUALIFICATION
1. Principal	1	M.Sc. Nursing with 3 years of teaching experience or B Sc (N) with 5 years of teaching experience.
2. Nursing Tutor	2	B.Sc.Nursing /Diploma in Nursing Education & Administration/Diploma in Public Health Nursing with 2 years clinical experience.
3. P.H.N	2	Diploma in Public Health Nursing with 2 years clinical experience.

Norms for GNM School:

(For annual intake of 20 nurses)

Post	Number	Qualification	Experience
1. Principal	1	M.Sc. Nursing	3 Yrs. of Teaching Experience
		B.Sc. Nursing (Basic)/ (Post Basic)	5 Yrs. of Teaching Experience
2. Vice Principal	1	M.Sc. Nursing or B.Sc. Nursing (Basic)/(Post Basic)	3 Yrs. of Teaching Experience
3. Tutor	4	M.Sc. Nursing or B.Sc. Nursing (Basic/Post)/ Diploma in Nursing Education & Administration/Diploma in Public Health Nursing with 2 years clinical experience	
4. Additional Tutor for Interns	1		

Human Resource for DTC (District Training Centre)

S.No	Cadre	Number
1.	Head of the Department	1
2.	Tutors	4

HR for Resource Centre: For planning, Data Analysis, and Resource support

S.No	Cadre	Number
1.	Senior consultants	2
2.	consultants	2
3.	Epidemiologist	1
4	Entomologist 1	

GUIDELINES FOR STRENGTHENING OF ACCIDENT & EMERGENCY DEPARTMENT

The accident and Emergency Care facilities of hospitals are one of the main stay in the chain of medical care offered by the present day hospitals. The need for purposeful emergency health care delivery through an Emergency Department is well recognised, and all hospitals must be able to provide basic life support through their Emergency Services to the patients in need within appropriate time.

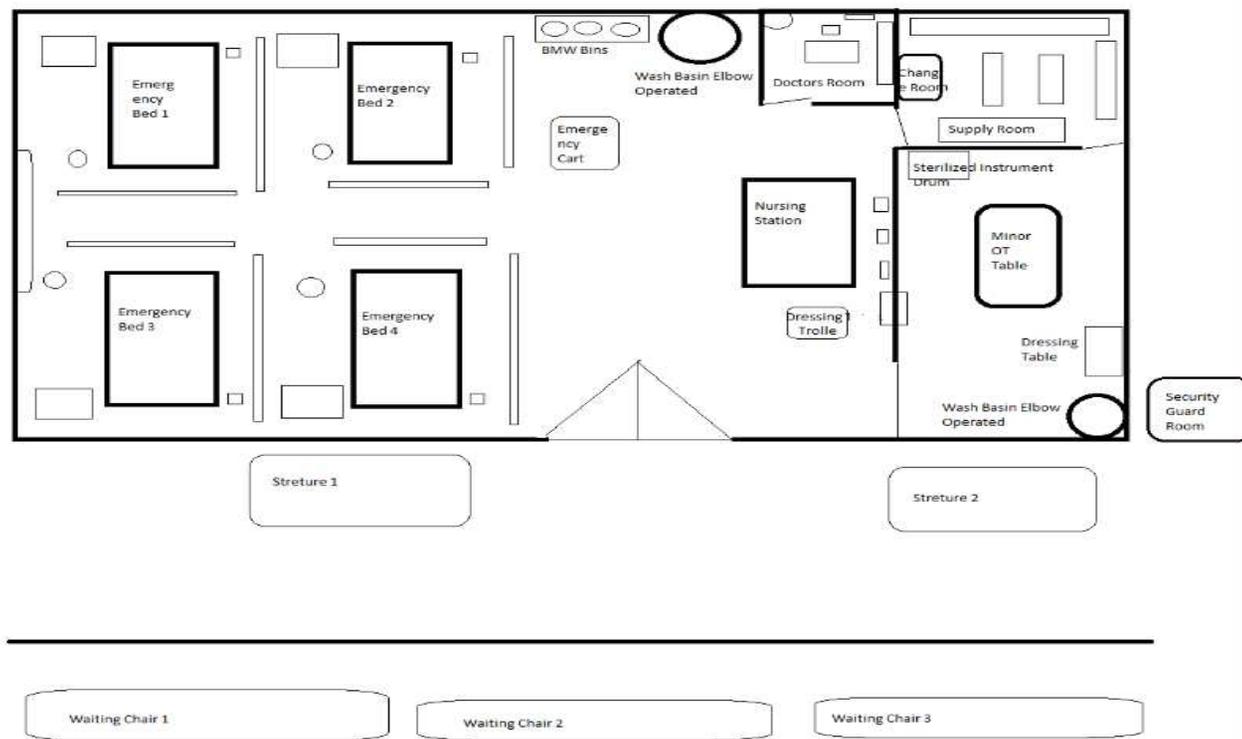
A conceptual organization of an Accident and Emergency Care System for a hospital is presented in the following paragraphs which can also be customized to the need of the district hospital.

1. Spatial Requirement for a 4-bedded Emergency Care

Emergency Department Spatial Requirement									
Room		No. of Occupants	Occupants/ Room	Area/ Occupant	No. of Rooms	Area/Room (M ²)	Area (M ²)	Area (Sq. Ft.)	Remarks
Reception & Registration					1	30.00	30.00	323	Outside/ covered area
Stretcher, Wheelchair & Trolley					1	21.00	21.00	226	
Waiting Lounge					1	42.00	42.00	452	
Triage		4	4	10.50	1	42.0	42.00	452	
Exam./ Treatment Room					1	21.00	21.00	226	
Plaster Room					1	21.00	21.00	226	
Casualty Medical Officer's Room					1	15.00	15.00	161	
Nurses Room					1	15.00	15.00	161	
Change Room					1	10.50	10.50	113	
X-Ray					1	36.00	36.00	387	
Clean utility					2	10.50	21.00	226	Optional/ Supply Room can be Used for the same
Dirty utility					2	10.50	21.00	226	Optional/ A dirty linen trolley may be used
Equipment Sterilization					2	10.50	21.00	226	Optional/ Supply Room can be Used for the same
Supply storage Room					2	10.50	21.00	226	
Security cum Drivers Room					1	15.00	15.00	161	Outside covered area
Toilets								0	
	Patients				2	14.00	28.00	301	

	Staff				2	10.50	21.00	226		
Janitor					1	3.50	3.50	38		
Sub Total Area of Emergency Room							145.50	1557		
Total Area Required								405.00	4333.5	

2. Proposed Lay Out



3. Proposed Equipment Requirements for Emergency department.

EQUIPMENT PLANNING FOR EMERGENCY DEPARTMENT	
Name of Equipments	Quantity
1. Ventilator	1
2. Foot suction	1
3. Electric suction machine	1
4. Laryngoscope blade (all sizes)	5
5. B.P cuff P&A	6
6. Defibrillator	1
7. Glucometer	2
8. Flash Autoclave	1
9. Crash Carts	2
10. Hydraulic Trolley	2
11. Patient Shifting Trolley	2
12. Wheel Chair	2
13. Needle Cutter	4
14. Multipara Monitors	4
15. Disaster Management Cupboard	1
16. Dressing Trolley	4
17. Pulse Oxymeter	1
18. Transport incubator	1
19. ECG Machine	1
20. Syringe Pump	1
21. Infusion Pump	2
22. X-Ray View Box	3
23. Minor OT table	1
24. Emergency Trolley beds	4
25. IV Stands	6
26. Bed Side Table	4
27. Computers, Accessories etc	1

4. Manpower Requirement for Emergency department.

Manpower Requirement of 4 Bedded Emergency				
Designation	No per Shift (3)	Total	Remarks	Essential
Casualty Medical Officer	1	4	1 per shift and 1 for holidays	3
Nurses	2	8	2 per shift and 2 for holidays	6
Attendant	2	6	2 per shift	4
Dresser	1	3	Can be OT In charge	2
Security Guard	1	3	1 per shift	3

ICU STRENGTHENING

Number of ICU beds in a district level facility should be 5 – 10 % of the total bed strength of the hospital. Out of these, they can be equally divided among ICU and High Dependency Wards. For example, in a 500 bedded hospital, total of 25 beds will be for critical care. Out of these 13 may be ICU beds and 12 will be allocated for high dependency wards. A single and open ICU is recommended for ease of operation. Beds may be allocated to different divisions.

Facilities

- Nurses Station
- Clean Utility Area
- Equipment Room

At district hospital, a Level II is recommended. Few well functioning District Hospitals with limited tertiary care facilities may also plan for a level III ICU. Key component of level II ICU are as follows

-

- Multisystem life support
- Invasive and Non invasive Ventilation
- Invasive Monitoring
- Long term ventilation ability
- Nurses and duty doctors trained in Critical Care
- Availability of CT facilities (MRI is desirable)
- HDU facility will be desirable
- Blood bank either own or outsourced

ICU Staffing: ICU staffing is one of the most important tasks and components of the whole programme. Dedicated, highly motivated, ready to work in stress situations for long periods of time are the type of personal needed. They include:

- Intensivist/s
- Resident doctors
- Nurses
- Respiratory Therapists
- Nutritionist
- Physiotherapist
- Biomedical Engineer
- Other support staff - cleaning staff, guards and Class IV

MEDICAL RECORDS DEPARTMENT:

Although Bhore Committee (1946) stressed the importance of keeping adequate medical records, no significant improvement has been made in this respect. Medical records' lying haphazardly around the hospital is a common site. There is no scientific method of storing of medical records. Safety, security and retrieval of the Medical Records are other areas of concern.

The medical record is a clinical, scientific, administrative and legal document relating to patient care in which is recorded sufficient data written in sequence of events to justify the diagnosis and warrant the treatment and results. The medical record is indispensable from the standpoint of the patient, the doctor, and the hospital and for medical education and research.

For patient: it serves to avoid unnecessary repetition of investigations and treatment procedure, assist in continuity of care, serves as evidence in case of MLC, provides necessary information for insurance and contributory health schemes.

For doctors: assurance of quality, quantity, and adequacy of diagnostic and therapeutic measures, protection in the event legal question arises.

For Hospital: protection in the event of legal matters, proof of type and quantity of care provided, serves as administrative document of personnel performance, assist in future planning and decision making.

Space and General Facilities Requirement

Space and general facilities requirements:

Area	Space Requirement
50 bedded hospital	150-175 sq feet.
100 bedded hospital	225-250 sq feet
200 bedded hospital	450-500 sq feet
500 bedded hospital	1000-1200 sq feet

Staffing: Standard staffing requirements for Medical Records Department is huge and difficult to comply with in Public Hospitals. Still each District Hospital shall have at least 2 Medical Record Technicians and two class IV employees. One Medical Officer can be assigned additional charge of supervision of Medical Records department. If trained MRD technicians are not available, supportive staff e.g. Pharmacist, Lab Tech, or clerical staff may be sent for short term course on MRD management.

Location: MRD may be ideally located in the Administrative block in close proximity with the Inpatient block.

Indexing: should be done as per ICD classification.

Storage and retrieval:

- i). Filing. Any of these filing methods may be used
 - a) Numerical method b) Alphabetic Method c) Chronological method
- ii). Filing Procedure: common three types of filing procedures are:
 - a) Vertical b) Horizontal c) suspended.

Computerization of MRD will help in saving time and manpower. Medical Records should be kept away from moisture; regular pest control of the MRD should be done. Medico legal records should always be kept in safe custody, i.e. under lock and key. Separate medico legal record movement register should be maintained at the medical records department.

ANNEXURE 'H'

Telemedicine Centre:

- As stated by ISRO the Telemedicine Room should have at least 250-450 Sq ft of carpet area. The actual area required would depend upon the medical equipment that is being planned to be interfaced with the Telemedicine set up. The room should be, if possible, located in that part of the hospital, which has less traffic and is less noisy.
- The Telemedicine Room should be for sufficiently big to accommodate placement of two computers with 17" monitors each, a printer, and connectivity (VSAT indoor) equipment rack and few chairs. Telemedicine Room at Patient End should be slightly bigger to accommodate Medical diagnosis equipments viz. X-Ray Scanner, Pathological Microscope, and a bed for taking ECG. If the video conferencing equipment is also to be used for CME, then bigger Room may be required depending on the number of participants and also to accommodate a bigger ~ say 29".
- Doctor End Room should be at least 12' x 20' and Patient End Room at least 15' x 30'. If the patient Side Room also has an ICU then minimum space required for the Room is 1500 Sq. Feet. In case of Medical College Hospitals a Standard Class room size of at least 30' x 50' is required with good provision for placement of Audio/ Video System as a virtual classroom
- Room Temperature should be maintained between 18 to 25 deg C, Preferably using split A/ c, for less background noise during video conferencing.
- Room should have electrical outlets for connecting various equipments and a very good earthing pit. Five 15Amp Sockets for UPS and five 5Amp Sockets for other diagnostic equipments are advised, with proper arrangement of the Power Supply during emergency.
- The UPS should be at least of 3 KVA capacities depending on the equipment load.
- Shall have good acoustics, using sound absorbing panels or heavy curtains, for noise free environment during video conferencing.
- The curtains and walls should be light blue or gray in colour, to give good contrast/view for video conferencing.
- Room should have good flooring, preferably vinyl or ceramic floor, to reduce noise.
- Room should have good illumination, to get good picture quality for video conferencing.
- Wherever VSAT is used, antenna Size is 1.8 meter in diameter for Remote end & 3.8 meter for speciality end and weight is 500-2000 kg. Ideally the Antenna should be located at top of the building and should be within distance of 40m (Cable Length) from the Telemedicine Room
- Antenna should have unobstructed field of view to the Satellite, and no LT/HT Power lines should be near the Antenna or in its field of vision.
- Wherever it is not possible to place the antenna on the building, it should be mounted on floor around the Hospital on a firm concrete base. In such cases, appropriate protection should be provided to prevent mishandling of the antenna elements.

Installation and Training

Once the equipment have been completely assembled and tested offline with the software, connectivity with the test centre at the Implementer's HQ should be done. As the Video Conference Equipment (VCE expo) would already be functional there would be an assurance of connectivity for the data section. At least 10 test specialist consult requests should be sent using different sizes of files and the results sent tested for errors. This would confirm readiness of the 'Store and forward mode'.

Testing Desktop Video-Conferencing (for quality, clarity of sound and picture and frame rate, should follow this. Real time viewing of data from equipment likes ECG, X-Ray scanner; Microscope, Ultrasound, etc should be tested next. Finally a combination of live VC with high resolution data capture and transfer should be tested.

Once the equipment is live, the local staff can be trained. The client's staff should then carry out similar dry runs using test and non-patient data.

Devices and Telemedicine Equipment

Telemedicine Software from a mature company is generally well designed and capable of connecting to most equipment. However certain equipment connects better as compared to others. Hence as long as the right hardware has been selected the software causes no glitches.

The training requirements would be the same for the software, but based on the equipment added to it, each piece would have its own training program. The learning curve for both the trainers and the trainees becomes easy. Even connectivity requirements become less if the equipment used is optimized to produce faster and leaner output. So let's first look at the kind of equipment required for a Telemedicine station and later at the selection criterion and procedures.

Telemedicine equipment can broadly be divided into the following components:

- Information Technology (IT) hardware
- Connectivity Hardware
- Video conferencing hardware
- Medical Hardware

IT Hardware: IT hardware mainly comprises the equipment, which helps run the software, interface with the user, connect to the medical devices, store data securely and exchange data when required. This would include computers, multimedia devices, scanners, security devices, daughter boards and hand held devices.

Connectivity Hardware: Devices required for connectivity would include items like modems, VSATS, routers, hubs, switches and structured cabling.

Video Conferencing Hardware: These are equipment that permit full screen TV, plasma TV or Projection TV, live two way audio and video conferencing.

Medical Hardware: This would comprise all the clinical instrumentation that would be attached to the Telemedicine system to capture data from the patient.

