Designing for Well-being

Realizing Benefits for Patients, Visitors and Staff through Best Practice Hospital Design.

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Programme Details

1. Corporate Video

2. National University Health System (NUHS)

3. Realizing Benefits for Patients through Best Practice Hospital Design

4. Promoting Staff Well-being & using of technology to streamline work processes, improves operation efficiency & productivity
NATIONAL UNIVERSITY HEALTH SYSTEM
Building hospitals of the future

We are designing human experiences, not buildings

Voice of our customers and stakeholders
NG TENG FONG GENERAL HOSPITAL AND JURONG COMMUNITY HOSPITAL

Integrating and transforming care in the West

**Community Hospital**
Total of 12 levels
400 beds (11% Private, 89% Subsidised)

- **Level 1**
  Admission & JCH Specialist Outpatient Clinics
- **Mezzanine Level**
  Clinical and Administration Space
- **Level 2 and 3**
  Private Wards
- **Level 4 to 12**
  Subsidised Wards

**Inpatient Block**
Total of 16 levels
700 beds (25% Private, 75% Subsidised)
28 Intensive Care Unit beds and 42 High Dependency beds
15-bed Isolation Ward next to Accident & Emergency Department
18 Operating Theatres

- **Level 1 to 4**
  Diagnostics and Treatment
- **Level 5 to 10 (West Wing)**
  Private Wards
- **Level 5 to 16 (East Wing)**
  Subsidised Wards

**Specialist Outpatient Block**
Total of 8 levels
Training Centre
Auditorium
Diagnostic services
Pharmacy on every clinic floor

- **Level 1**
  Training facilities (including an auditorium) and Diagnostic Imaging services
- **Level 2**
  Pre-admission testing, Medical Social Services and retail
- **Level 3 to 7**
  Specialist Outpatient Clinics (120 consult rooms)
- **Level 8**
  Administration
Designing for Well-being: Realizing Benefits for Patients through Best Practice Hospital Design
Design Principles

- Seamless and Hassle Free Service
- Warm, High Touch
- Healing and Green Environment
- Technology as an Enabler
- Enables full integration of care and services across all facilities
- Fully integrated with neighborhood
- Ease of way finding
- Increases longevity and flexibility
- Tropical design
- Energy Efficient & Sustainable Building
Creating a healing environment for our patients

We set out to build NTFGH & JCH with gardens to engage the senses of sight, sound, scent and touch, so as to promote a healing environment for patients. Many of the patients gave the thumbs up for the restful and healing environment filled with greenery and water features.
Optimising Natural Light Without the Glare

To create the most conducive healing environment for our patients, we took great care in planning the wards. Sun angles were studied throughout a year to nail down the best orientation of the ward towers, to achieve optimum natural daylight while reducing glare from the sun.
1. Pandemic-prepared, mass-casualty and decontamination-ready for industrial accidents due to proximity to industrial areas/Jurong Island.

2. Dedicated Trauma Lifts for critical cases to be transferred directly to the operating theatres and Intensive Care Unit for swift and immediate medical care.

3. Modular Trauma-ready Rooms where each room combines two typical resuscitation units to provide space for life-saving care.

4. Elderly-friendly Features such as natural lighting; ambient temperatures; larger fonts on signage; warm colours; and vinyl flooring with built-in layer of cushioning for better foot comfort.
Planning hassle-free spaces for patients – focusing on functional relationship between services

Distributed Pharmacy on every SOC floor, One-stop payment for patients

Closer to lifts for Geriatric patients
One Queue One Bill - Streamlining the Patient Journey at NTFGH's Specialist Outpatient Clinics

A typical outpatient clinic visit may mean a long process for patients.

At NTFGH, we adopt a whole new approach to outpatient clinic appointments. Processes are streamlined at the Specialist Outpatient Clinics for the convenience of patients and their caregivers.
Haze Fan in “non-aircon” wards

- Naturally ventilated wards (Subsidised wards that are “non-aircon”) are equipped with Haze fan system. It can be activated via BMS at ORC.

- Filtered air is delivered to each patient bed. In addition, active carbon filter is also provided for the removal of unpleasant odour from haze.

- Haze fan should operate with Jalousie windows closed by means of a switch at nurse counters.
A Window for Every Patient

- Fan-shaped ward with better air flow and privacy for patients as compared to conventional wards.
- Natural light to aid in patients’ physical recovery and improved mental state as well as provide awareness of time passage and reinforce the natural circadian rhythms.
- Optimise infection control and enhanced comfort for staff.
- For subsidised patients, the East-West orientation takes advantage of prevailing wind conditions to promote ventilation. Private patients will have the preference of an air-conditioned room with individual thermal control or a naturally ventilated environment.
An Intensive Care Unit With a Difference

- NTFGH houses Singapore’s first and only combined critical care facility to merge an Intensive Care Unit (ICU) with a High Dependency (HD) Unit, to deliver critical care in one location, by one team, with one standard of care.

- More than medical care, the ICU is also unique because patients have access to adjacent outdoor areas with natural light, greenery and fresh air. Stabilised ICU patients can be wheeled out to outdoor gardens, fitted with the necessary equipment and power supply points for emergency medical care.
JurongHealth Mobility Park

Jurong Community Hospital (JCH) is the first hospital in Singapore to feature a mobility park. The Park is specially designed to enable patients from NTFGH and JCH to break away from the confines of the wards and indoor gymnasium, and to receive outdoor rehabilitation treatment in a more open garden setting, which will also help them to re-integrate into the community.
Learn, Interact, Feel, Experience Hub (LIFE HUB)

Our patients from NTFGH and JCH may experience challenges when adjusting to their home environment. To help prepare these patients for home, JCH has created the Life Hub a simulated three-room residential flat, designed to create an interactive learning environment showcasing best practices of home health and safety, with healthcare aids and equipment weaved into the mock-ups to demonstrate their practical use.
Information Technology
Transforming Care.
Bringing Health to Every Home.

Powered by
Technology that Works

Hassle Free Experience
4 Less: Paper-less, Chartless, Scriptless & Filmless

Consolidated for Intelligence
Clinical decision support – enable preventive and predictive analysis

Designed for Collaboration
Beyond the hospital walls – enable collaboration with patients and community partners

Raising productivity
Increase value-added work

Architected for Transformation
Beyond illness care to wellness care
Use of technology and automation to streamline work processes, improves operation efficiency & productivity, leading to better care and services’

Meaningful real-time information is readily available to patients and staff

### Hospital Information System
- Real Time Location Sys (RTLS)
  - Tracking of patient and high value asset
  - Hand hygiene compliance

### Integrated EMR Suite
- Physician Order Entry
- Clinical Doc
- Ambulatory
- Emergency
- OR, ICU,
- Anesthesia
- Radiology
- Laboratory
- Patient portal
- Clinician portal
- Scheduling
- Bed mgmt, Call mgmt

### Building Services
- Air-Con
- Pneumatic tubes
- Audio, Video Conferencing
- Nurse Call
- Carpark system
- Staff Card Access
- Lift
- Turnstile

### Hospital Integration Exchange Bus
1. Connect
2. Translate
3. Send

### Medical devices/equipment integration
- Vital signs machine
- MRI
- ECG
- Pharmacy Automation

### Logistics Hub
- Automated Guided Vehicle (AGV)
- Many others….
Ng Teng Fong General Hospital Awarded HIMSS Analytics EMRAM Stage 7

Scriptless, Chartless, Filmless and Paperless environment

At HIMSS EMRAM Stage 7, Ng Teng Fong General Hospital (NTFGH) has adopted full digital clinical documentation and demonstrated how the integrated Electronic Medical Record (EMR) and analytics are used to improve clinical, operational and business areas. The integrated EMR system is designed for the data to flow seamlessly between all clinical services under JurongHealth.

As an integrated development with the adjacent Jurong Community Hospital (JCH), the doctors and staff of both NTFGH and JCH are able to have fast and accurate access to information, resulting in better patient care coordination.

Reaching HIMSS Stage 7 also validates NTFGH’s use of information systems to improve staff efficiency, information accuracy and overall cost savings. With the automation and digitizing of patient documentation, more time is dedicated to patient care.
The Cook Chill System that we adopted allowed us to prepare foods that ensures consistent quality in every batch, while reducing labor required for preparation and serving. It also allows for better space and equipment utilization and fully yield the economics of scale especially in the raw material processing and in the preparation of the meals.
Cook Chill Technology and Electronic Meal Ordering System help improve efficiency and reduce reliance on manpower

First deployment of full Cook Chill Technology at hospital kitchen in Singapore

By adapting cook-chill in a 1,100 bedded hospital:

- All patient meals (breakfast, lunch & dinner) can be prepared 1 day in advance in a single shift
- Reduction of manpower

Ordering Meals Through Electronic Meal Ordering System (EMOS)

- Eliminate serving of wrong meals to patient
- Remove the need to generate paper orders, reducing waste
- Simplifies meal consolidation and improves production accuracy
Productivity: Time and reliance on manpower reduced through the use of automated machines

**AGVs** for transportation of items such as meals and medical supplies, reducing manpower requirements.

**Mini-AGV** is used to transfer samples in the laboratories, saving more than 108 hours of non-value added activities per year.

**Robots** perform cleaning duties, enabling the existing workforce to focus on higher value work.
Productivity: Use of technology and automation to manage high workloads and streamline work processes

**Patient Information Board**
that is electronically updated with clinician's name, patient’s drug allergy and other critical information

**Warehouse Management System**
for service points to top up requests; reduced manpower requirements needed for inventory management by more than 50%

**Macerator**
enables nurses to focus on patient care by saving time and also reduces the rise of cross infection

1 Queue, 1 Bill,
enables staff to focus on financial counselling and other value added services while managing a monthly load of 12,000 outpatients
Productivity: Use of technology and automation to manage high workloads and streamline work processes

REAL TIME LOCATION SYSTEM

RTLS server

Sends actualization as patient arrives at ward

Patient registration system (SAP)

Location update

Patient is given a RTLS active tag upon admission

Sending Patient to ward passing through RTLS sensor

RTLS tag received RTLS sensor info and report arrival of ward via WiFi and update Patient Registration System

Patient admission actualized seamlessly without human intervention
Productivity: Use of technology and automation to manage high workloads and streamline work processes

Easy identification of equipment locations

RTLS server

Location update

Nurse needs an equipment but don’t know where is it now

Equipment with RTLS tag reporting location via WiFi

Nurse is able to search from RTLS sys for the equipment’s location
Promoting Staff Well Being
Team Bonding
Over the last six years, we have worked closely together to help design and create a unique patient environment. Teamwork and collaboration are critical success factors to the smooth opening of NTFGH & JCH.
Thank You