

## JURONGHEALTH INTEGRATED HEALTHCARE HUB — TAKING FORM. TAKING SHAPE.

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From left: Mr Lim Yong Wah, chairman of JurongHealth board; Dr Amy Khor (Minister of State for Health); Mr Foo Hee Jug, CEO of JurongHealth; and Health Minister Gan Kim Yong.

# Good health care at the doorsteps

JurongHealth makes a major move to provide seamless integrated patient care for the community in Western Singapore

### Ahmad Osman

THE Ng Teng Fong General Hospital (NTFGH) is scheduled to open its doors at the end of 2014 followed by the adjacent Jurong Community Hospital (JCH) in 2015.

The foundation of the Jurong Health Services (JurongHealth) hospitals serving the population in the western part of Singapore is almost completed and work has already begun for the construction of the superstructure.

JurongHealth signed a contract with GS Engineering and Construction to build the superstructure of the hospitals with 1,100 beds in an integrated health-care hub along Jurong East Street 21.

GS Engineering and Construction is well-established in the fields of engineering, civil engineering, housing, plant, environment and power plant with proven track record in hospital projects, including both public and private hospital projects in Korea.

Health Minister Gan Kim Yong was the guest of honour at the superstructure signing ceremony held at JCube shopping centre on Sept 8. Other VIPs include the Minister of State for Health, Dr Amy Khor.

Speaking at the signing ceremony, JurongHealth's chairman, Mr Lim Yong Wah, says: "We are a step closer to our vision to bring about seamless integrated care for the community in the west."

"We are building not only two new hospitals but a fully integrated development. Our team has worked hard in designing facilities with the community in mind such as integrating the hospitals with the surrounding buildings with convenient link to the public transport system. We have also incorporated community spaces within our premises for wellness activities."

In the construction of both hospitals, JurongHealth is making good progress, Mr Lim adds.

Their development is driven by what JurongHealth's chief executive officer, Mr Foo Hee Jug, describes as its vision "to transform care and bring health to every home".

He says: "We want to redefine our traditional illness care role — first to keep our community healthy and empower them to do this. And when they do fall ill, to provide care that is better coordinated and integrated from the patient perspective."

"We have started by designing our hospitals with



From left: Mr Foo Hee Jug, CEO of JurongHealth; Health Minister Gan Kim Yong; and Mr Michael Huh, CEO of GS Engineering and Construction.



A sneak peek of ICU's features in a lifesized mock-up at the event.

our patients as the main focus. Our twin development of the acute and community hospitals are planned, designed and being built together to bring about seamless acute to sub-acute to rehabilitation care, all on one site."

### Ready for any crisis

The Emergency Department in NTFGH, for example, is designed for faster patient care, shorter waiting time, and is scalable to accommodate an anticipated increase in patients. It integrates its functional and spatial relationships to optimise resources, cut wastage and promote efficient and effective workflow processes.

JurongHealth's senior consultant and head of

the Emergency Medicine Department, Dr Quek Lit Sin, explains: "Patients may need immediate medical intervention and the resources required must be rapidly accessible to meet crisis situations."

"We planned, for example, for vertical adjacencies with critical services such as the operating theatre and intensive care unit via direct and dedicated lifts to ensure that critical care patients receive the appropriate treatment with no delay."

Given the ageing population, provisions will be made in the new hospital for individual rooms in the Emergency Department for elderly patients with special attention paid to, for instance, the lighting, to make it more conducive for them.

The individual rooms will also provide privacy for the patients, who can be accompanied by their caregivers. All these elderly-friendly features will reduce the stress level for this group of patients, especially during emergencies.

In addition, with the hospital's close proximity to Jurong Island, the Emergency Department in NTFGH is designed to be ready for any crisis involving mass casualties or hazardous materials incidents.

### Focus on intensive care

NTFGH is also transforming the traditional model of intensive care. It is the first in Singapore to have an Intensive Care Medicine (ICM) department. This department helms the combined Intensive Care Unit (ICU) and High Dependency Unit (HD) and streamlines care that cuts across the different conventional ICUs — surgical, medical, cardiac and neurosurgical.

The ICU in the hospital will have a dedicated floor with 74 beds for intensive care and high dependency patients.

JurongHealth's senior consultant and head of the ICM department, Dr Tan Chee Keat says the modular rooms and co-location of ICU and HD beds allow for convertible flexibility between intensive care or high dependency to reduce the need for physical and care team transfers. Intensive care patients whose condition has improved are seamlessly managed as high dependency patients in the same room, cared for by the same team.

The concept of "a window for every patient"

will be extended to intensive care patients because exposure to natural lighting has proven to be a conducive environment that will help in the healing process for patients.

"We have also integrated an outdoor terrace fitted with the necessary equipment and supply points for stabilised patients to enjoy a little sunshine and fresh air as part of the rehabilitative care plan," says Dr Tan.

### Safety in the operating theatre

NTFGH's operating theatre has many safety elements conceptualised with the patient and the clinician in mind. These include having integrated electronic medical records and unified communications, among others.

Design elements such as indirect lighting and soothing artwork help patients and their relatives to feel secure and reduce their anxiety.

"Information will also flow to relatives about the status of their loved ones via a secure process," says JurongHealth's senior consultant and head of the orthopaedics department, Dr Gamaliel Tan.

Sterile supplies and case carts are stored in a large clean sterile core in preparation for the day's cases. It will be linked directly to the sterile supplies department via a dedicated lift and only personnel in sterile scrubs are allowed in the clean core.

Used dirty supplies and soiled equipment will flow down to the cleaning department through a different route "so that clean and dirty don't mix", says Dr Tan.

### Event highlights

To showcase the patient-centred facilities, life-sized mock-ups of the ward, ICU, operating theatre and simulated HDB living and dining rooms for rehabilitative patients were displayed at the signing ceremony to give the public a preview of the features that will be incorporated in the two hospitals.

As part of JurongHealth's efforts to help the community stay in good health, visitors to the event were able to get free health screenings from measuring their blood pressure to checking their height and weight, and even getting a blood test and counselling session at the "Health on Track" screening booths on site.



PHOTOS: JURONGHEALTH, RAY KHOO

# Patients come first

JurongHealth's two new hospitals are designed to complement one another for more efficiency and convenience

Douglas Chew

SEAMLESS and integrated healthcare — that's what patients can expect when they seek treatment at the Ng Teng Fong General Hospital (NTFGH) and the Jurong Community Hospital (JCH).

Patients who seek acute treatment at NTFGH and later rehabilitate or convalesce at JCH will not require the usual discharge at the first hospital, only to be readmitted at the next one. Mr Foo Hee Jug, JurongHealth's chief executive officer, says: "It would almost be like moving from one ward to another. Patients will feel it is one organisation they are stepping into."

Conversely, patients whose condition deteriorates at the community hospital, JCH, can be easily transferred to the acute hospital, NTFGH, to receive treatment. The integration goes deeper than just being located together. Services common to both, such as housekeeping and procurement of medicines, will be done as one organisation, reaping economies of scale that will generate cost-savings. The electronic medical records system will be accessible by doctors from both hospitals, reducing the need for repeated tests and recording of medical history once these have been done at either hospital.

Given a clean slate to create the new hospitals, JurongHealth seized on the opportunity to design the facilities and

clinics to better serve the patient. At the heart of its design is the concept of being patient-centric. "We want to deliver great care for the patients, and simplify access to health care for them," says Associate Professor Cheah Wei Keat, chairman of JurongHealth's medical board.

Paying close attention to details, teams and workgroups have been formed comprising JurongHealth's staff, who are now working at Alexandra Hospital, to define the future they want to see in their new hospitals.

Citing an example of a diabetes patient, Assoc. Prof. Cheah explained that such a patient normally has to visit a slew of specialists. Beyond trudging from clinic to clinic, the multitude of appointments required takes time. At the new hospitals, these clinics will be in close proximity, and the schedules of JurongHealth will be efficiently planned.

This team of specialists will conduct ward rounds together to more effectively provide the best treatment for these diabetes patients. The same concept of care will be applied to major groups of common ailments plaguing Singapore's population today.

An Intensive Care Medicine department will also bring together the normally separated functions of specialised Intensive Care Units (ICU), and will be located with the High Dependency beds

on the same floor at NTFGH. Patients will then experience a uniform standard of care when given intensive care treatment, and those whose condition has improved can be stepped down to the next level of high dependency without having to be shifted to a different ward.

The Emergency Department, which is in an environment that can cause great discomfort and disorientation to some patients, especially the elderly, will see improvements. They include allocated space to create islands of tranquillity, and contrasting colour schemes to help patients distinguish between the walls and the floor.

A simulated three-room HDB flat and a mobility park will be built to help recovering patients get back on their feet again and regain their independence, speeding their reintegration into the community at JCH.

**Engaging the community**  
In line with its mission to bring health to every home, JurongHealth is working with partners including community services and general practitioners.

"First of all, we want to ensure people stay well. However, people do fall ill. We want to heal them to the best of our ability, and then empower them to look after their own health. To do so, it requires us to work with various stakeholders, like the patient, their caregivers, and



From left: Mr Foo Hee Jug, CEO of JurongHealth; Mr Lim Yong Wah, chairman of JurongHealth board; and associate professor Cheah Wei Keat, chairman of JurongHealth's medical board at the site of NTFGH and JCH.

community partners, to be able to bring together everything the patient needs into an ecosystem," explains Mr Foo.

Already, programmes such as JurongHealth's Integrated Care Pathway for Chronic Obstructive Pulmonary Disease, a debilitating ailment mainly caused by smoking, have helped patients and caregivers connect the dots from detection, diagnosis, treatment to step-down care.

Celebrating the superstructure milestone where the building structure will now begin to rise from the ground, Mr Foo reflects: "To build two hospitals in a span of four years is not a long time."

"We are not just building the infrastructure but also the JurongHealth family, where we have to double our staff numbers by 2014 in time for the hospital's opening, and ensure that the new staff's vision and values are aligned to deliver the best health care to our patients."

# Every bed in the ward gets window view

Innovative fan-shaped wards will provide fresh air and sunlight to aid the recovery of patients

Grace Ma

JURONGHEALTH breaks new ground in nursing and holistic integrated patient care with its upcoming Ng Teng Fong General Hospital (NTFGH) and Jurong Community Hospital (JCH) superstructure.

Its director of nursing, Madam Kuttiammal Sundarasan, says: "We have always adopted a patient-centric approach at JurongHealth. Arriving at this superstructure is also a step closer to our nurses' dream of improving their work environment and experience."

One unique feature of both hospitals, which is also a first among hospitals in Singapore, is the innovative fan-shaped wards that allow each bed to come with a window.

Mdm Kuttiammal says: "This fan-shaped design breaks out of the conventional ward design to facilitate care and rehabilitation of our patients."

"It allows our patients to enjoy the greenery without actually being outside physically. The fresh air and good ventilation within the ward will facilitate healing and provide patients with a comfortable place to rehabilitate in."

Much study was also put into the angles of the sun's rays throughout the

year, resulting in ward towers that are oriented in a way that optimises daylight while minimising the glare from the sun.

The curvilinear and aerodynamic form of the towers also take advantage of prevailing wind conditions to promote enhanced airflow. This results in higher airflow that reaches even the corner beds. Corridors are also single-loaded to maximise airflow throughout the entire structure.

Other features include a nursing station as well as a shower and toilet in every patient's cubicle or room. This ensures the presence of a nurse at all times, who can also provide assistance to patients in their daily living activities.

Other than patient welfare, Mdm Kuttiammal says that all these features are also designed with the health-care workers' welfare in mind.

For staff working in the wards, there is greater infection control with improved ventilation as well as a more conducive working environment. She adds: "Ease of movement within and between facilities and focus on multi-disciplinary team work are major considerations. Working closely with doctors and allied health colleagues will



feature highly in how nursing operates at NTFGH and JCH. Productivity will definitely increase with such close collaboration. Patient care will also be standardised across both hospitals to ensure efficient patient care to enhance the overall experience of the patient."

Examples of such seamless patient care and staff welfare include having the Emergency Medicine Department (EMD) and Intensive Care Unit built close to each other to reduce time taken to transfer patient to critical care areas.

Common services such as imaging, catering, pharmacy, logistics and other support services are also thoughtfully

planned out to be adjacent to each other. Mdm Kuttiammal observes that there are now more patients with complex care needs compared to the early years of nursing.

She says: "These patients need the services of a multi-disciplinary team that is made up of doctors, allied health professionals and specialty-trained nurses. "We have given high priority to the training of our nurses and many of them have gone through advanced training. We now have trained nurses who are working closely with the other health-care professionals to meet the needs of this group of patients."



Director of Nursing, Madam Kuttiammal Sundarasan (left) shares the fan-shaped design of the wards at NTFGH and JCH allow each bed to come with a window.

# One team, seamless care

A unified standard will be provided for critical care patients at the Ng Teng Fong General Hospital

THE Ng Teng Fong General Hospital (NTFGH) will have its entire fourth level devoted to critically ill patients. Seventy beds or 10 per cent of all hospital beds will be for patients in need of high dependency or intensive care service.

To deliver unified and seamlessly integrated care, Alexandra Hospital, part of Jurong Health Service (JurongHealth), approved the creation of the Department of Intensive Care Medicine (ICM) in April this year. It is the first in Singapore to combine the Medical Intensive Care Unit, Surgical Intensive Care Unit, Cardiac Care Unit and their High Dependency Units (HDU) under one roof.

"This unique opportunity of forming a new department and planning the organisational structure and facility from scratch allows us to engineer the design of the facility to best care for our patients," says Dr Tan Chee Keat (right), senior consultant and ICM's head of department.

The department will fulfil an important role in health-care by caring for the critically ill.

"Our purpose is very clear. Quality care is what we are aiming for. We want to make it safer for our patients, through

the standardisation of facilities, equipment and processes," she adds.

Another feature will be the collocation of the ICU and HDU. Each of the rooms will have a convertible flexibility into either ICU or HDU, reducing the need for physical and care team transfers. Thus, intensive care patients whose condition have improved can be managed as high dependency patient in the same room, cared for by the same team.

"This will help avoid errors related to information loss during transfer of care, and the medical team can maintain good rapport with our patients and their families. The patients and their families frequently have strong emotional attachment to the care team," says Dr Tan.

The state-of-the-art critical care complex will complement NTFGH's key design feature of a healing environment. A window in every single room will allow natural light and a view of the surroundings. Two gardens within the

ICM complex and two roof terraces fitted with selective ICU equipment and supplies, will let more stable patients be wheeled outdoors to enjoy some sunlight, greenery and fresh air. These measures will help alleviate the patient's suffering and reduce the chances of ICU psychosis or delirium.



Patients who used to require intensive care but have since improved their conditions to a high dependency level do not need to shift to a different ward.

Dr Tan says: "We want our patients to have exposure to sunlight and moonlight, to differentiate day and night and have contact with nature. All these will help to reduce the incidence of ICU psychosis. The roof terrace will also be a great place for our medical staff to relax and break away from the stress of work."

The ICM level will be optimised in three dimensions to be adjacent to various services, such as the Operating Theatre, Emergency Department (ED), Diagnostic Imaging and other procedural services. Designed to facilitate the flow of patients in critical condition, dedicated lifts will allow rapid and direct access from these facilities.

NTFGH marks another major milestone towards its completion, as the superstructure of the building will begin to take shape now that the foundation

works are completed. Dr Tan has already been building up the ICM health-care team in preparation for the day the new hospital opens.

Doctors specialising in the field of intensive care medicine are called intensivists and require a minimum of eight to 10 years of postgraduate training. Dr Tan, who is an intensivist, notes: "There is no short cut to becoming an intensivist because the things that need to be done in an ICU are very intense and frequently require critical therapeutic decision making." — Douglas Chew

# Ready for the future

JurongHealth's Emergency Medicine Department will serve the needs of an ageing population

Lai Yi Ming

ENSURING that the infrastructure fits the flow of the patient's journey is the key in designing the hospital of the future, and this was how the Emergency Medicine Department (EMD) in Ng Teng Fong General Hospital (NTFGH) was conceptualised.

"The department is 'future-proofed' — 20 years from now, it will still be able to meet Singapore's needs and its most pressing concern, the ageing population."

Says Dr Quek Lit Sin, head and senior consultant, EMD, Alexandra Hospital Singapore, JurongHealth: "At JurongHealth, our focus is to be patient-centric. We see an increasing need for the elderly patients to be managed at the emergency department and we see the need for more resources to be moved to

the department as well as to meet the expectations of the public.

EMD's design is a result of a comprehensive planning process that involved discussions with ground users such as health-care professionals as well as charting the process the patient undergoes every step of the way.

"We identified what patients want and need, and the whole structure is focused on this. In order to design the structure, we first need to know what the flow process is," says Dr Quek. "We talked to our own ground people and realised the 'value-add' we can provide our patients. We then instructed the architect to design the structure so that the flow can fit into it."

In the past, the emergency department was usually an afterthought. Usually tucked in a corner, it worked because the people in the department made it work, he adds.



Being located where important resources are readily accessible will boost efficiency. The EMD has been conceptualised as the epicentre where it is closely connected to departments or resources it is functionally dependent on. For instance, the imaging or X-ray department in located on the same level as EMD while the operating theatre is directly one floor up.

Also, it is located close to the Jurong Community Hospital. The proximity of an emergency department to a community hospital is a new model of care already in existence, says Dr Quek. This allows a smooth transfer of patients from acute to sub-acute setting.

**Fewer stops, less wait**  
Separate resources have been allocated to manage different types of patients. Priority is usually given to acute cases because of their urgent nature. But having dedicated separate resources will ensure that various types of patients receive the attention they need.

Also, charting the patient's journey is important as it identifies certain steps that can be combined, thereby cutting down on waiting time — an important consideration. For instance, registration, triage and consultation used to be in a series of steps.

However, at EMD, these have been combined at one point.

"Time-saving processes create more value-added time with this group of patients, meaning the ultimate time spent is the same but we pack in more value. We have more time to talk to the patient



The whole structure of the new Emergency Medicine Department is focused on what patients want and need, says Dr Quek Lit Sin (left), head and Senior Consultant, EMD, Alexandra Hospital Singapore, JurongHealth.

and do a better diagnosis," says Dr Quek. This is particularly important as symptoms and conditions of geriatric patients are not always clearly defined and more time is needed to understand their conditions, he adds.

**Geriatric-friendly**  
EMD has an observation unit where elderly patients will be sent to for further review, which may include calling upon the services of other specialties such as a physiotherapist or geriatrician. This is a transition stop to avoid having to admit them, as the elderly, being more susceptible to infection in a hospital, are usually better managed outside the hospital.

To address the ageing population, the whole department is designed for geriatric patients. Incorporating geriatric-friendly elements means resources are not duplicated, and yet result in a universally conducive environment.

Details that aim to improve a patient's visit to the EMD include the use of colour schemes that are suitable for the geriatric eye, adjustable air-con temperatures to improve the patient's comfort and variable lighting to give them a sense of time.

The department is also partitioned to give patients more privacy as well as to cut off the noise and chaos within the department, which can be disturbing especially for the elderly.



Ng Teng Fong General Hospital is on schedule to open at the end of 2014, followed by Jurong Community Hospital in 2015. PHOTOS: JURONGHEALTH

# Integration to provide better service

JurongHealth's two new hospitals located side by side will facilitate a high level of patient care

**Douglas Chew**

FOR the first time in Singapore, an acute care hospital and a community hospital will be built at the same time and co-located on the same site.

The Ng Teng Fong General Hospital (NTFGH) and the Jurong Community Hospital (JCH) aim to serve patients better through a tight integration between their services. They will provide the entire continuum of inpatient care, to meet the patients' acute needs at the NTFGH, after which step-down, sub-acute or chronic care can be delivered at the JCH.

JurongHealth's assistant chief operating officer, Mr Ng Kian Swan (left), says: "From the patients' care perspective, there will be a smoother and hassle-free experience for patients transferred from one facility to the other, thus enabling our patients to receive care which is efficient, seamless, comfortable and accessible."

Citing an example of a 75-year-old man who gets admitted to NTFGH with a hip fracture, Dr Chua Chi Siong (left), Jurong Community Hospital's medical director, explains that the patient might receive a hip implant but will still not be able to walk for some time, and will need continued hospital care.

This man can be transferred directly to JCH, across the linkway connecting the two buildings on the second floor, and receive rehabilitative treatment there, literally without having to leave his bed, as the entire bed can be wheeled over.

In the case where the recovering patient develops acute medical issues requiring acute care, specialists' in-



put from NTFGH will augment the care provided by the medical team at JCH. Currently, to bring such a level of support to the patient is difficult, as the hospitals providing the different levels of care are separate organisations.

These walls are being broken down at JurongHealth, as they grow a culture of patient-centric care, to best serve the patients. "Organisationally, we are working to tear down the silos and have a team concept," says Dr Chua. "By raising the level of integration, we hope to be able to provide a higher level of post-acute care to our patients."

Beyond hospital care, JurongHealth is working with community partners to help patients return to regular life. Mr Ng says: "We envisage JCH will play a greater role in supporting intermediate and long-term care and JCH will be a community hospital in the truest sense of the word with staff going into the community to work with partners and supporting people."

"Getting the patient recovered and discharged is just one part of the community hospital's work. To make sure the patient goes back and reintegrates into the community is another," adds Dr Chua. "We will continue to build

bridges and pilot processes with our community partners so that our patients will be able to transit back to the community setting and continue to be well cared for."

### Get back in motion

According to Mr Ng, one of the key design concepts for JCH includes supporting "ageing in place" — helping seniors remain at home, healthy and independent. JCH will host a series of facilities designed to help patients as they recover to return to the community.

Currently in the works is a simulated three-room HDB flat, designed to create an interactive learning environment showcasing best practices of health and safety at home, with health-care aids and equipment presented in the mock-ups to demonstrate their prac-



Anti-clockwise from left: Road crossing training area at the mobility park that include road safety features; a table setting of various dining sets to encourage those who face difficulties in self-feeding in a dining room mock-up; a showcase of a barrier-free living room to help those with mobility issues become more independent.

tical use. Patients will be assisted by nursing staff and their caregivers to help them adapt to a home environment even before discharge from the hospital.

A concept store next to this "flat" will stock a wide range of assistive devices such as walking canes, wheelchairs and feeding accessories that can be purchased by the patients and their caregivers.

A mobility park for rehabilitation, comprising walkways of different surfaces including sand, pebbles, ramps and steps, is being built, to train patients to resume walking. "The facility is specially designed to enable patients to break away from the confines of the wards and indoor gymnasium, and to receive outdoor rehabilitation treatment in a more spacious and open garden, which will also help them to reintegrate into the community," says Dr Chua.

JurongHealth is also planning to add mock-ups of taxis, buses and MRT carriages where disabled patients can safely practise using the public transport system.



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