



1 April 2011

## **MEDIA RELEASE**

**Embargoed Till 11am, 1 April 2011**

### **NUH and JurongHealth move into their next infrastructure development milestone to meet the healthcare needs of the community in the West**

*Right on track to expand public healthcare infrastructure and to ensure patients receive the right care at the right place and at the right time, National University Hospital (NUH) and Jurong Health Services (JurongHealth), award contracts to move into the next stage of building the new NUH Medical Centre, Ng Teng Fong General Hospital (NTFGH) and Jurong Community Hospital (JCH).*

NUH and JurongHealth ink contracts with Penta-Ocean Construction Pte Ltd today, marking the next developmental phase of their respective healthcare facilities to keep up with the rising demand in healthcare. Both the substructure and superstructure works of the NUH Medical Centre are awarded to Penta-Ocean Construction Pte Ltd. The substructure work for the Medical Centre has started and is progressing well. JurongHealth will commence the substructure phase of its Ng Teng Fong General Hospital (NTFGH) and Jurong Community Hospital (JCH) in the West. Both contracts will be awarded to Penta-Ocean Construction Pte Ltd.

Guest-of-Honour, Minister for Health, Mr Khaw Boon Wan, graced the signing ceremony today, and witnessed the symbolic exchange of mementos between NUH and JurongHealth. With the close collaboration between NUH and JurongHealth, patients can look forward to an improved healthcare system, an enhanced healthcare infrastructure, and more seamless clinical services in the western region.

Conveniently located directly above the Circle Line Kent Ridge MRT Station and expected to be completed in 2013, the NUH Medical Centre will enable the NUHS to effectively deliver its three-part mission as an academic medical centre – to provide quality, affordable clinical care to Singaporeans, conduct translational clinical research and educate our future doctors and nurses.

As Singapore's newest public healthcare cluster, JurongHealth is operating out of Alexandra Hospital and building the future 700-bed NTFGH and 286-bed JCH, slated to open in 2014 and 2015 respectively. The new hospitals will augment Singapore's healthcare capacity and facilitate the integration of services and care processes within the hospitals and across the community to bring about better care delivery

### **Combined new facilities to meet rising healthcare demands**

The clusters will be working on various collaborative efforts, including planning and developing clinical services, training and education, manpower and infrastructure. More importantly, the new building developments will enhance the nation's healthcare infrastructures and match the growing projected demands.

Mr Joe Sim, Chief Executive Officer, NUH said, "We have been partnering and supporting JurongHealth since its inception. This synergistic relationship will continue as we work together to train medical students and specialist trainees, engage other healthcare stakeholders and meet the healthcare needs of the people in the western part of Singapore. Building on NUH's tertiary strengths and the new capacity and network of JurongHealth, we can also advance towards our common mission of providing patient-centred, integrated and accessible healthcare to Singaporeans."

NUH and JurongHealth are natural partners in the healthcare eco-system in the western region. Apart from augmenting the national healthcare infrastructure, the collaboration between the clusters can ensure synergy and alignment in the disciplines and clinical services.

Leveraging on each other's strengths, NUH and JurongHealth can create a system where duplication of services and processes will be minimised. Patient care,

treatment and rehabilitation, etc, can flow seamlessly between the hospitals to deliver a hassle-free continuum of care.

Said Mr Foo Hee Jug, Chief Executive Officer, JurongHealth, “As we build our new hospitals in the west, NUHS and JurongHealth will leverage one another’s strengths to facilitate seamless flow of care, treatment and rehabilitation for our patients. Our collective healthcare hardware when completed, and partnership, will put us in good stead to synergise our efforts to best serve our region and enable the right level of care for patients at the right setting.”

### **More hospital beds, more clinical facilities, continuum of care**

When completed, the 20-storey NUH Medical Centre will house the National University Cancer Institute, specialist outpatient clinics (SOC), day surgery operating theatres and the various clinical services and amenities.

At a national level, the upcoming NTFGH and JCH will add another 700 and 286 hospital beds respectively, ensuring the seamless transition of patients from acute to community care. NTFGH will further boost the tally of outpatient clinical services with a dedicated eight-storey SOC block.

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### **About National University Hospital**

The NUH is a tertiary specialist hospital and major referral centre for a wide range of medical and dental specialties including Cardiology, Gastroenterology and Hepatology, Obstetrics and Gynaecology, Oncology, Ophthalmology, Paediatrics and Orthopaedic Surgery. A member of the National University Health System, it is the principal teaching hospital of the NUS Yong Loo Lin School of Medicine (YLL SoM).

With combined resources from the NUS YLL SoM and Faculty of Dentistry, the NUH is poised to meet the healthcare needs of patients, train future generations of doctors more effectively, and help develop solutions to our healthcare problems through research.

In 2007, the NUH was tasked by the Ministry of Health to develop two new national centres, the National University Cancer Institute, Singapore (NCIS) and the National University Heart Centre, Singapore (NUHCS) to meet the growing needs for cardiac and cancer treatment. The National University Cancer Institute, Singapore (NCIS) offers a broad spectrum of cancer care and management covering both paediatric and adult cancers. The National University Heart Centre, Singapore (NUHCS) brings together cardiac specialists and experts from a multitude of medical and surgical disciplines to provide a comprehensive and holistic approach to the treatment of heart problems.

In 2004, the NUH became the first Singapore hospital to receive Joint Commission International (JCI) Accreditation, an international stamp for excellent clinical practices in patient care and safety.

**[www.nuh.com.sg](http://www.nuh.com.sg)**

### **About Ng Teng Fong General Hospital and Jurong Community Hospital**

Jurong Health Services (JurongHealth) is Singapore's new public healthcare cluster formed to facilitate the integration of services and care processes within the hospital and across the community to better serve the healthcare needs in the West.

JurongHealth is building the 700-bed Ng Teng Fong General Hospital which will be twinned with the 286-bed Jurong Community Hospital to provide holistic care for patients. Slated for completion from 2014, the hospitals will form an integral part of the Jurong Lakeside District Masterplan, with easy access to public transport services (Jurong East MRT Station, Jurong East Bus Interchange) and retail/ entertainment hubs. Working with partners such as healthcare providers like General Practitioners, polyclinics, community hospitals, long term care providers and voluntary welfare associations, we aim to bring health and wellness one step closer to home.

JurongHealth is currently operating Alexandra Hospital, a 400-bed acute general care hospital, till 2014 when the new hospitals are ready in the West. From our base at Alexandra Hospital, we offer patients a comprehensive range of clinical services in a tranquil and healing environment including Orthopaedic Surgery, General Surgery, Urology, Dental, Eye, ENT, Cardiology, Respiratory Medicine, Geriatrics, Endocrinology, General Medicine, Nursing and Allied Health.

**[www.juronghealth.com.sg](http://www.juronghealth.com.sg) | [www.alexhosp.com.sg](http://www.alexhosp.com.sg)**

**Annex A: Ceremony to mark the award of contracts by the National University Hospital (NUH) and Jurong Health Services (JurongHealth) to Penta-Ocean Construction Co Ltd**

**Date:** 1 April 2011 (Friday)

**Time:** 10.00am to 11.00am

**Venue:** Auditorium, NUHS Tower Block

**Programme**

- 10.00am Arrival of Guests
- 10.15am Arrival of Guest-of-Honour, Mr Khaw Boon Wan, Minister for Health
- 10.20am Speech by Mr Joe Sim, NUH Chief Executive Officer
- 10.25am Signing of contract between NUH and Penta-Ocean Construction Co Ltd
- 10.30am Signing of contract between JurongHealth and Penta-Ocean Construction Co Ltd
- 10.35am Speech by Mr Foo Hee Jug, JurongHealth Chief Executive Officer
- 10.40am Exchange of memento between NUH and JurongHealth
- 10.45am Refreshment  
Exhibition
- End of programme

## **Annex B: Quick Facts about NUH Medical Centre**

Target Operational Date	Mid 2013
Gross Floor Area	72,000 m <sup>2</sup>
Clinical Facilities	<ul style="list-style-type: none"><li>• National University Cancer Institute, Singapore (NCIS)</li><li>• Specialist Outpatient Clinics<ul style="list-style-type: none"><li>- Anaesthetic Outpatient Consultation</li><li>- Colorectal</li><li>- Gastroenterology and Hepatology</li><li>- Medicine</li><li>- Ophthalmology</li><li>- Otolaryngology – Head and Neck Surgery</li><li>- Surgery</li><li>- Urology</li></ul></li><li>• Day Surgery Operating Theatres</li><li>• Ambulatory Care Centre</li></ul>
Clinical Support Services	<ul style="list-style-type: none"><li>• Diagnostic Imaging</li><li>• Dietetics</li><li>• Laboratory Medicine</li><li>• Medical Social Work</li><li>• Rehabilitation</li></ul>
Amenities	<ul style="list-style-type: none"><li>• Circle Line Kent Ridge MRT Station</li><li>• Retail and food outlets</li><li>• Close to 400 parking lots</li></ul>

## **NEW GENERATION PATIENT EXPERIENCE**

### **Hassle-Free Experience**

- Conveniently located above the Circle Line Kent Ridge MRT Station
- Link bridges connecting the new building to Kent Ridge Wing, which links to Main Building for seamless patient transfer for other outpatient and inpatient services
- Designated drop off/ pick up points for ambulance, private cars and taxis for smooth traffic flow

### **Patient-Centric Design**

- No more than three turns to patient care areas
- Facilities designed from the perspective of users to minimise movement between different patient care areas within the building and the entire hospital campus (e.g. ancillary services like imaging, dietetics are located within close proximity to clinical services)
- Separate corridors for patients on trolleys to give greater privacy

## **A GREEN BUILDING**

The NUH Medical Centre is set to be a patient-centric healing environment that is firmly grounded on green and energy efficient design. The hospital is working towards achieving the Green Mark for Building Award (Platinum) for the new centre. Resented by the Building and

Construction Authority, the Award is presented to buildings that meet several assessment criteria including energy and water efficiency, environmental protection, indoor environment quality as well as the extent of green features.

#### **Energy and Water Efficiency**

- Shading devices to keep out the heat while allowing for natural light into the building
- Standby mode for escalators and lifts
- Building Management System (BMS) to detect water leakage and to monitor and optimise water usage

#### **Environmental protection**

- Roof garden on different floor levels to reduce heat gain
- Rain water harvesting for landscape irrigation, saving up to 80% of portable water required

#### **Indoor Environment Quality**

- Use of low volatile organic compounds paints for better indoor air quality

### **THE NATIONAL UNIVERSITY CANCER INSTITUTE, SINGAPORE**

The National University Cancer Institute, Singapore (NCIS) offers a broad spectrum of care and management for both paediatric and adult cancers.

NCIS' strength lies in the multi-disciplinary approach taken to develop a personalized and comprehensive plan of care for patients and their families, incorporating cancer awareness, diagnosis and treatment.

NCIS will provide an integrated one-stop, patient-centric cancer centre equipped with state-of-the-art treatment facilities to serve increasing patient load.

#### **Key Facilities and Services**

- Total floor area of 13,000 m<sup>2</sup> (More than four times the current floor space)
- Offers both adult and paediatric oncology services
- Designed to house seven radiation therapy treatment machines (Linear Accelerator)
- Expected to handle ~3700 more patients by 2015 (or 50% more)
- Radiation Therapy Centre
- Breast Centre
- Health Resource Centre

**Annex C: Quick Facts about Ng Teng Fong General Hospital (NTFGH) (Inpatient and Specialist Outpatient Clinics Blocks) and Jurong Community Hospital (JCH)**

Site Location	Located in the heart of the Jurong Lakeside District, the site is situated along Jurong East Street 21. It is within easy access for the public in the West and will be connected to amenities such as the Jurong East MRT station, bus interchange, retail and business complexes.
Site Area	54,144m <sup>2</sup> <ul style="list-style-type: none"> <li>• NTFGH (Inpatient) and JCH sites: 34,404 m<sup>2</sup></li> <li>• NTFGH (SOC) site: 19,740 m<sup>2</sup></li> </ul>
Completion Target	Year 2014 for NTFGH. Early Year 2015 for JCH
Massing	<ul style="list-style-type: none"> <li>• 8-storey NTFGH (SOC)</li> <li>• 16-storey NTFGH (Inpatient) including 12-storey Subsidised Ward Tower and 6-storey Private Ward Tower over 4 storey Podium</li> <li>• 9-storey JCH</li> <li>• 2 Basements</li> <li>• Approximately 800 car park lots at levels B1 and B2</li> </ul>
Entry	<ul style="list-style-type: none"> <li>• Dedicated vehicle drop off/pick up and carpark entry/exit for JGH (SOC) block, NTFGH (Inpatient) and JCH from Jurong East Street 21</li> <li>• Shuttle bus drop off/pick up points at NTFGH (SOC) and NTFGH (Inpatient) blocks from Jurong East Street 21</li> <li>• A&amp;E (walk in) has a dedicated drop-off driveway</li> <li>• A&amp;E ambulance from Boon Lay Way</li> <li>• Separated service road entry from Jurong East Street 21</li> </ul>
Total Beds	<p>NTFGH (Inpatient): 700</p> <ul style="list-style-type: none"> <li>• 142 Private - A1/ B1 Class including one Deluxe Suite</li> <li>• 432 Subsidised - B2/C Class</li> <li>• 28 Intensive Care Units</li> <li>• 42 High Dependency Units</li> <li>• 56 Isolation Beds</li> </ul> <p>JCH: 286</p> <ul style="list-style-type: none"> <li>• 30 Private - A1/ B1 Class</li> <li>• 240 Subsidised - B2/C Class</li> <li>• 16 Isolation Beds</li> </ul>
Specialist Outpatient Clinics	<ul style="list-style-type: none"> <li>• 30 Clinics and 120 Consult Rooms</li> <li>• Training Centre</li> <li>• Auditorium</li> <li>• Diagnostic Services</li> </ul>
Medical Services	<p>NTFGH</p> <ul style="list-style-type: none"> <li>• Musculo-Skeletal/ Orthopedics and Sports Medicine</li> <li>• General Medicine</li> <li>• General Surgery</li> <li>• Cardiology</li> <li>• Oncology and Radiation Therapy</li> <li>• Urology</li> <li>• Geriatrics</li> <li>• Diabetics</li> <li>• Eye</li> </ul>

	<ul style="list-style-type: none"> <li>• Ear, Nose and Throat (ENT)</li> <li>• Dental</li> <li>• Rehabilitation and Allied Health</li> <li>• Diagnostic and Interventional Radiology</li> <li>• Nuclear Medicine</li> <li>• Health &amp; Wellness Centre</li> </ul> <p>JCH</p> <ul style="list-style-type: none"> <li>• Rehabilitation and Allied Health</li> <li>• Geriatrics</li> <li>• Dementia</li> </ul>
Operating Theatres	8 Major Operating Rooms (OTs) at Level 3 of NTFGH Podium <ul style="list-style-type: none"> <li>• 6 Operating Theatres</li> <li>• 1 Isolation / Septic OT</li> <li>• 1 Robotic OT</li> </ul>
Day Surgery	10 Day Surgery Operating Rooms at Level 3 of NTFGH
Endoscopy Suites	4 Endoscopy Suites at Level 3 of NTFGH
Training Centre	<ul style="list-style-type: none"> <li>• 300-seat Auditorium</li> <li>• 100-seat Lecture Room</li> <li>• 7 Training Rooms for 25 to 50 persons each</li> <li>• Surgical Skills Lab</li> </ul>
Staff Facilities	Lounge; Games Room; Gymnasium; Aerobics Studio; Staff Library; Mother's Suite; Reading Area; Child Care Centre
Food Court & Cafeteria	<ul style="list-style-type: none"> <li>• Cafeteria on Level 2 of NTFGH(Inpatient)</li> <li>• Refreshment corners at Level 1 of NTFGH (Inpatient); Level 2 of NTFGH(SOC) atrium and other retail areas at NTFGH (SOC)</li> </ul>
Garden	Level 1 <ul style="list-style-type: none"> <li>• Community Wellness Park - including Multi-purpose open lawn, informal Amphitheatre, Multi-Sport Court, event and lunch Plaza, jogging trail</li> <li>• JCH Pre-function Patio</li> <li>• Mobility and Road Safety Park</li> <li>• "Jelutong" Walk</li> <li>• Roof top gardens at Level 3 of NTFGH (SOC), Level 3 of JCH and Level 4 of NTFGH (Inpatient)</li> </ul>
Other amenities	<ul style="list-style-type: none"> <li>• Handicapped-Family-friendly restrooms</li> <li>• Retail Facilities</li> </ul>

## **Annex C1: Fundamental Design Principles**

### **Siting Rationale**

Taking advantage of the linear plot of land which is separated by the Jurong Gateway Road, the NTFGH (Inpatient) and JCH will be sited on the larger plot while the NTFGH (Specialist Outpatient Clinics) will be on the smaller plot.

### **Separation of pedestrian and vehicular traffic**

The division of the plot provides the opportunity to segregate pedestrian and vehicular traffic, while at the same time create a natural infection control barrier between the ambulatory zone comprising NTFGH (SOC) and the rest of the hospitals comprising the NTFGH (Inpatient) and JCH. As patient and visitor traffic volume is expected to be the highest for the clinics, locating the NTFGH (SOC) nearest to the MRT will bring about greater convenience and easy access to the hospital for patients and the public at level 2. Vehicular traffic would be at level 1 and basements 1 and 2.

### **Connectivity and enhancing infection control**

All three buildings will be connected via link bridges where pedestrian traffic will be directed to Level 2; patient traffic and hospital personnel traffic to Level 3. This allows for easy, convenient and safe access for patients and visitors moving within the buildings. The dedicated access for patients ensures privacy in the hassle-free patient transfer from NTFGH (Inpatient) to JCH or patient flow from NTFGH (Inpatient) and the NTFGH (SOC).

### **Synergy in operations**

Hospital backend and logistics functions will be co-located at Basement Level 2 to optimise transport via Automated Guided Vehicles (AGVs) and efficient consolidation of goods for distribution. Other services will be also be consolidated for operational efficiency and synergy. For example, the two hospitals will be wired up for IT connectivity and RFID tracking. Plans are in place for adjacency of common services such as Digital Imaging, kitchen, pharmacy and warehouse. The proximity of the Accident & Emergency Department (A&E) to JCH can also facilitate direct admission of patients who require only sub-acute care to the JCH in future.

### **Vertical and horizontal adjacencies**

#### **A&E and Isolation Ward**

Patients who arrive at the A&E and who require isolation can be easily transferred to the adjacent isolation ward. This arrangement decreases the risk of contaminating general areas as compared to designs where the isolation ward is located away from A&E.

#### **A&E and Diagnostic Imaging**

Strategic placement of vital resources such as the X-rays, CT scans and MRIs adjacent to A&E allows for A&E to tap on these shared resources as variation in patient volume may demand.

#### **Main Operating Theatres and Day Surgery Operating Theatres (OT)**

Co-location of Major and Day Surgery OTs on one common Integrated Interventional Platform allows resource sharing as well as flexibility to vary usage.

#### **Intensive Care Units (ICU) and High Dependency Wards (HD)**

Clustering the ICU and HD patients on the same level allows better utilization of staff and resources; as well as promotes the latest trends towards co-management of intensive care patients and flexibility of sharing of intensive care capacity among all disciplines.

### **Inpatient Rehabilitation and General Ward**

The orthopaedic ward and inpatient rehabilitation department will be strategically co-located at Level 11 to facilitate ease of patient movement.

### **Trauma Lifts**

The OT and ICU located on levels 3 and 4 respectively, will be connected by specially-sized and equipped Trauma Lifts. These lifts will also link both levels with the A&E located on Level 1. This dedicated pair of lifts will allow the patient on a bed to fit comfortably with two staff and resuscitation equipment. Standby equipment and staff will also be planned to ensure quick recovery of lift function or the rescue of trapped patients in the event of a breakdown. Such connectivity is now standard in many renowned hospitals overseas such as Ronald Reagan UCLA Medical Centre, Cleveland Clinics.

## **Designing for the future**

### **Simulating the future Accident & Emergency Department**

Key portions of the hospital have been designed using LEAN principles. For example, the A&E has been designed to maximise resources and efficiency in workflow and layout. The A&E layout is planned to allow for the area that requires the most manpower and resources to be concentrated in the centre; which allows manpower to be easily re-deployed to surrounding areas when the need arises.

The A&E department employed the use of advanced simulation modeling programme to test the feasibility of the proposed layout, as well as plan for future expansion. With the programme, the A&E team was able to stress-test the planned layout and workflow based on current patient load and projected patient loads in 2015 and 2020. Armed with the simulation results and statistics, the team is able to forecast how its infrastructure can support an increasing patient load, and allows hospital planners to design a scalable A&E to meet changing and future demands.

### **Maximum flexibility and ease of conversion**

The Specialist Outpatient clinics Modular Design provides for maximum flexibility and conversion in future. In the NTFGH (SOC), each clinic module consists of four consultation rooms, and corresponding support rooms which include a teaching hub. The wards are also modular and repeated throughout the ward tower to allow flexibility for conversion between different classes of wards in the future.

### **Pandemic-preparedness**

The hospital is designed to enable swift lock-down during pandemic, minimizing disruptions to normal visitor, patient and staff workflows. Provisions will be made to separate the ventilation of 'clean' air from 'dirty' air; and isolation beds on every floor will minimise cross infection during transfers. Selected A class wards will also be specially equipped so that they may be quickly converted to negative pressure isolation rooms quickly. In addition, the space between the A&E & JCH will enable the A&E to screen and triage patients during a pandemic. The space will also be equipped with decontamination equipment so that the hospital will be ready for hazmat incidents.

## **A Window for Every Patient**

The revolutionary fan shape ward, designed with a window for every patient, will significantly improve ventilation, privacy and comfort for patients. In addition to subsidised and private wards, this concept will also be extended to ICU and HD beds to promote healing for critically ill patients. The attributes of the fan-shaped ward includes:

**Enhance patient comfort and recovery:**

Patients will be able to enjoy greater privacy as they can choose to face their own window instead of the next patient when they rest. They can also draw the curtains and yet maintain good ventilation as well as enjoy the soothing view of sky gardens located on every floor to bring the feeling of the exterior into this urban hospital as well as to create a conducive and healing environment for both patients and visitors. Even during wet weather conditions, patients will enjoy the well-ventilated environment with effective use of storm louvres to keep out wind-driven rain.

**Enhanced ventilation and optimising natural light**

For subsidised patients, the East-West orientation of ward towers takes advantage of prevailing wind conditions to promote ventilation. The massing concept also enhances wind movement due to the aerodynamic forms of the building. Patients in private wards will have air-conditioned room with individual thermal control or a naturally ventilated environment.

**Enhanced Working Environment and Infection Control for Staff**

Without the traditional low headwall shared between two back-to-back beds, the fan-shape ward layout also optimises infection control. Improved and enlarged space around the beds also translates to a better, ventilated working environment for staff - with more maneuvering space for nurses to conduct procedures and bedside care.