Start Right: Workshops for patients recently diagnosed with diabetes

‘Start Right’ is a new programme for patients recently diagnosed with type two diabetes and who have not seen a dietitian.

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Medication dispensing system nabs two awards

Around 6,400 patients are expected to benefit from the system daily when it is fully rolled out at all of NHGP’s nine polyclinics by end 2015. In this article, we explore some of the system’s winning features.

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Harnessing technology in laboratories to improve care

Over the last 15 years, NHG Diagnostics has harnessed technology to improve care delivery and enhance patient experience at laboratories across all of NHGP’s nine polyclinics.

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Growth charts for children aged between 0 to 72 months

Growth charts were derived in 2000 from the findings of a study led by NHGP’s first Chief Executive Officer Dr Shanta Emmanuel. They are presently used across Singapore to monitor the growth of young children.

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An Auspicious Start in Pioneer

On 7 February 2015, NHGP began its engagement work with the Pioneer community on an auspicious note by joining their SG50 Lunar New Year Celebrations.

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Talks series on healthy eating for Community Home residents

To equip senior citizens with basic nutrition knowledge and help them achieve a healthy diet, NHGP conducted a series of healthy eating talks for residents at the Asian Women’s Welfare Association (AWWA) Community Home for Senior Citizens. Wong Yuefen, Senior Dietitian, NHGP, conducted the talks from August 2014 to January 2015. About 20 participants attended each session.

The talks covered topics such as basic healthy eating guidelines, food label reading and tips on making healthier choices when eating out. Participants also learnt how to cook cold creamy oats and brown rice salad during the cooking demonstration.

As most of the residents were illiterate and English was not their first language, the sessions were conducted in Mandarin and Hokkien. The key messages of the talk were kept simple, and were reinforced with pictures in the slides.

An auspicious start in Pioneer

On 7 February 2015, NHGP started its engagement work with the Pioneer community on an auspicious note by joining their SG50 Lunar New Year Celebrations. Mr Cedric Foo, Member of Parliament for the Pioneer Single Member Constituency, graced the special occasion.

Amidst the fanfare of lion dance, songs and exercises, Dr David Tan, Deputy Head, Jurong Polyclinic, conducted a health talk. He spoke to over 700 residents on eating healthily during Lunar New Year. Ms Tracy Gan, Deputy Director, Development and Planning Office, also introduced the upcoming polyclinic. Participants were invited to check out the 3D model of the clinic and learn more from the information panels.

General practitioners dialogue at Choa Chu Kang Polyclinic

NHGP strives to work closely with Community Health Assist Scheme (CHAS)-certified general practitioners (GP) to deliver holistic, quality and continuing care for chronic patients. To do so, NHGP hosted a GP dialogue session at Choa Chu Kang Polyclinic on 31 October 2014. Eight participating CHAS clinics around the area attended the session.

Dr Richard Hui, Head of Choa Chu Kang Polyclinic, hosted the GPs. During his welcome speech, Dr Hui shared about the services offered at Choa Chu Kang Polyclinic and the number of active CHAS patients NHGP manages across its nine polyclinics. Mr David Kok, Deputy Director of Finance, also helped facilitate the dialogue session and answered enquiries on CHAS claims.

The dialogue session proved valuable for NHGP too. Not only did the GPs suggest ways to improve the partnership, they also raised pertinent issues such as the transfer of patients from NHGP to partnering GPs. The GPs were pleased to have a direct feedback channel to NHGP and look forward to partnering NHGP to transform primary care.
Start Right: workshops for patients recently diagnosed with diabetes

‘Start Right’ is a new programme for patients recently diagnosed with type two diabetes and who have not seen a dietitian. The free two-and-a-half-hour programme was conducted six times from April to December 2014 at Ang Mo Kio and Hougang Polyclinics. Each session featured interactive activities that introduced participants to the different types of carbohydrates, carbohydrate counting, the role of fats and fibre in a diet, food label reading and healthier cooking methods.

Each session was conducted in small groups of up to 10 participants, which allowed participants to interact and learn from one another. Participants are required to attend an individual consultation within two months of the programme, where a dietitian would help them apply their newfound knowledge in their daily lives.

Wall decals to educate patients about gum disease

Gum disease is an inflammation of the gums that can ultimately affect the bones that surround and support an individual’s teeth. This silent disease causes no discomfort until at an advanced stage. Although gum disease can occur at any age, it is more common among adults. To educate patients on the symptoms of gum disease, its prevention and how it can be cured, NHGP’s Dental Services put up dental education wall decals and posters in Toa Payoh and Jurong Polyclinics in January 2015.

The Dental Services team received positive feedback from patients and staff, who found the decals useful and appealing.

New fecal occult blood test analyser in laboratories

NHG Diagnostics (NHGD) performs more than 12,000 fecal occult blood tests (FOBT) every year. To enhance the laboratory’s capability and improve patient care management, NHGD implemented a new FOBT analyser in its laboratories in November 2014.

The new analyser automates the test process, which allows a higher number of tests to be processed. Furthermore, the analyser has reduced turnaround time for results from 24 hours to 4 hours. It also eliminates potential errors or biases that may arise when test reactions are visually interpreted. The analyser standardises results across all laboratories, allowing better comparability when determining trends.
Medication prescription filling system nabs two awards

The Outpatient Pharmacy Automation System (OPAS) won the Project of the Year Award 2014 – 2015 in the “Business and Information Systems” category and first runner-up in the “Most Innovative Use of Infocomm Technology (Public Sector)” category of the National Infocomm Award (NIA). The system was jointly developed by the National Healthcare Group Pharmacy (NHGPh), National University Hospital (NUH), Tan Tock Seng Hospital (TTSH) and Integrated Health Information Systems (IHiS).
To improve the accuracy and safety of medication dispensing process and operational efficiency, NHGPh has been installing automated machines to pick and pack the high volume of prescription orders at the clinics. The pilot started on 30 June 2014, at the Choa Chu Kang Polyclinic pharmacy. The pilot site was renovated from December 2013 to January 2014 for the installation of the machines. Bukit Batok, Woodlands and Toa Payoh Polyclinics have begun implementing the system. Presently, 800 patients at Choa Chu Kang Polyclinic benefit from the system daily. Around 6,400 patients are expected to benefit from the system each day when it is fully rolled out at all of National Healthcare Group Polyclinics’ (NHGP) nine polyclinics by end 2015. Let’s look at some of the system’s winning features.

**Enhancement of patient safety with accurate drug picking system**

OPAS has increased NHGPh’s ability to avoid medication ‘near misses’ and adverse drug events (ADEs). By automating some routine but error-prone work, rework rates have also dropped. Using barcode validation technology and Express software, traceability has increased; patient information and drug details can be traced and drugs recalled easily when necessary. The software would generate 2D barcodes, which store more information than 1D barcodes, on patient and drug labels on medication packaging. By scanning the barcodes, the pharmacist would be able to pull out information such as patient medication history, batch of medication, expiry date, ingredients, etc.

Safety processes are also built into the system to ensure accuracy. Before medication is dispensed, the pharmacy staff would scan both the patient’s drug label and the labelling on its packaging. The system would alert staff if a mismatch has been detected.

OPAS has also enhanced overall care. By relieving pharmacists from manual tasks, they can dedicate more time to patient education, research and medication reconciliations. They are also able to spend more time reviewing prescriptions and running ambulatory care clinics to monitor medication therapy.

**Higher productivity and savings achieved with automation**

By automating some routine work, NHGPh has been able to redesign the job scopes of its pharmacy technicians and pharmacists. Last April, NHGPh enhanced the job scope for pharmacy technicians to include career tracks such as patient care, operations, quality assurance and informatics. Besides assuming roles in drug distribution and inventory control, pharmacy technicians carry out quality assurance, safety audits and quality improvement initiatives. They have also started managing the maintenance requirements of machines and conducting users’ training and systems testing as part of their new role in informatics.

Through job redesigns, staff’s job satisfaction will increase, leading to lower attrition rates and related manpower costs. This translates to manpower savings for NHGPh.

Furthermore, OPAS’ First-in-First-out picking rules help reduce wastage and costs. The barcode technology enables medication expiry date and batch numbers to be tracked more efficiently and staff would be alerted when an item is nearing the end of its shelf-life. With faster and more accurate auto-loading and sorting of medication, this leads to better inventory management and productivity. NHGPh is progressively rolling out OPAS to pharmacies in polyclinics, and reviewing workflows. Productivity gains can only be fully quantified later.

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**Extensive automated system developed through combination of technology and robotics**

OPAS has transformed the way outpatient medication is prepared and dispensed, optimising the efficiency and speed of medication dispensing. As medication packaging varies from boxes to blister packs to loose tablets, OPAS is the first system in the region to integrate different types of high speed automated packaging machines. It is also the first in Asia to install the award-winning ROWA Vmax, which has 99.96% picking accuracy.

At the system’s nerve centre is RxPRESS – an integrated intelligent software system jointly custom-developed with NCS Pte. Ltd. that orchestrates the entire medication dispensing process. The software incorporates medication safety alerts, workflow optimisation capabilities and enables real-time tracking of processes and inventory. It has also been future-proofed – other medication automation machines can be used with it with minimal changes and can be easily scaled up to keep pace with the demands of Singapore’s ageing population.

The NIA award, jointly organised by the Infocomm Development Authority of Singapore and the Singapore Infocomm Technology Federation, was presented at the NIA Award Ceremony on 24 November 2014. The Project of the Year Award 2014 – 2015, an accreditation by the Project Management Institute for project managers, was presented on 25 March 2015.

Mr Wu Tuck Seng, Deputy Director of NUH’s Department of Pharmacy and Mr Mark Winn demonstrating some components of OPAS to Dr Vivian Balakrishnan, Minister for Environment & Water Resources.
Harnessing technology in laboratories to improve care

This year, we are celebrating NHGP’s 15th anniversary with a specially-created section. This issue, we will explore how NHG Diagnostics (NHGD) has been advancing its services and laboratory capabilities over the last 15 years – all to improve processes and enhance patient experience in NHGP’s nine clinics. Since April 2007, NHGD has earned and maintained its ISO 15189 Quality System for Medical Laboratory Certification. This longstanding certification is a mark of NHGD’s dedication towards improving primary care services, and the quality, reliability and accuracy of its laboratory processes and results.

A key part of quality healthcare involves the use of technology to address issues such as accessibility, value and cost. Over the years, NHGD has harnessed technology to improve care delivery and enhance the patient experience at laboratories across all of NHGP’s nine polyclinics. Let’s look at some ways NHGD has upgraded its centres and leveraged on technology during these 15 years.

Improve quality and cost-effectiveness with electronic platform

In December 2005, NHGD introduced Singapore’s first teleradiology services at its centres, starting from Ang Mo Kio Polyclinic. This initiative enables X-ray images to be digitally sent and received, making online radiology reading services possible. Reading of routine X-rays could be outsourced, reducing report turnaround time to an hour. This allows doctors to arrive at a clinical diagnosis faster, and provide timelier intervention and treatment for patients. Patients also benefited from receiving their results on the same day.

Turnaround time for results reading was also improved with the introduction of the tele-electrocardiography (ECG) to all nine NHGD centres in 2009. The digital recording allows doctors to review the digital ECG readings instantly on their monitors.

Digitisation to improve efficiency and care processes

With the launch of the e-Laboratory results module in June 2006, the routine printing of results was stopped. Besides minimising paper usage, this initiative enabled staff to access lab results more conveniently. Through digitisation, records could be managed easily and shared across all the nine polyclinics, enabling staff to access them quickly and deliver more timely care.

New equipment to improve access to medical services

In 2008, all of NHGD’s centres in the nine polyclinics were equipped with spirometry services for testing of lung functions.

In December 2013, the first ceiling-suspended X-ray system, with a height-adjustable examination table, was implemented at Woodlands Polyclinic. The system offers a wide range of movement that allows technique flexibility and facilitates imaging for patients. It is also safer and easier for both patients and staff, and has helped improve the examination’s turnaround time. Concurrently, a Full-Field Digital Mammography (FFDM) system was implemented at Jurong Polyclinic. This is the first time such technology has been implemented in a primary care setting. The FFDM system reduces the examination’s turnaround time and shortens appointment waiting time as its digital receptors are able to examine and capture breast tissue instantaneously.

Upgrades to enhance capabilities

The Radiology Information System (RIS) at all NHGD X-ray centres was upgraded in October 2013. The system now includes new functions, such as trending of results and selecting areas of examination through pictorial illustration of the human body.

On 24 January 2015, NHGD completed its recent upgrades for the centre in Woodlands polyclinic. The redesigned laboratory and optimised floor area made room for more service stations, such as phlebotomy stations, electrocardiogram rooms and registration counters. This reduces waiting time for patients. New technologies, such as an onsite biochemical analyser, have also been installed. The analyser enables the laboratory to process 95% of lab tests on-site. This shortens turnaround time as critical results can now be reported during office hours, facilitating healthcare practitioners who manage patients with acute diagnoses. Upgrading works for remaining centres will continue throughout 2015.
Committed to enhancing its capabilities to transform primary healthcare and meet the ever-changing needs of the community, NHGP has been improving its medical competency through training and research. To celebrate NHGP 15, let’s look at some of the significant research conducted by NHGP over the last 15 years.

Growth charts are essential for monitoring the growth of individual children, tracking growth changes and educating people on living a healthy lifestyle. Growth charts were traditionally used to identify short stature (height for age chart) and failure to thrive (weight for age and weight for height charts). Now, they are commonly used to monitor childhood obesity (weight for height and body mass index charts), which is becoming increasingly prevalent.

The growth charts for children aged 0 to 72 months were derived from the findings of a study led by NHGP’s first Chief Executive Officer (CEO) Dr Shanta Emmanuel titled “Anthropometric Study on Pre-School Children in Singapore”. The study, which was conducted from March to September 2000, aimed to update charts for height, weight and head circumference of children from birth to six years of age. It also aimed to produce growth charts for Singapore’s three major ethnic groups. The charts were last produced in 1988, and social and nutritional conditions would have changed since then.

Dr Shanta Emmanuel worked with Professor Tim Cole, Institute of Child Health, University College London, to develop the charts using the lambda-mu-sigma (LMS) method. The L curve measures changing skewness, M curve measures the median at each age, and S curve measures the coefficient of variation by age. The LMS method is a useful way to construct centiles and was also used to construct national charts in the United Kingdom and United States of America. A total of 21,082 healthy children from 16 polyclinics and 94 kindergartens were sampled. Children before two years of age had their height, weight and head circumference measured and those above the age of two had their height measured. Each child was measured twice to ensure accuracy – a third measurement would be taken if the first two measurements were inconsistent. Factors such as socioeconomic conditions were taken into account during the evaluation of the results.

Compared to the charts developed in 1988, the study found that a child’s height and head circumference did not change between 0 to 72 months of age. Only slight increases in weight and body mass index (BMI) were observed in children over four years old. The charts also showed that while differences between ethnic groups were small, Malay children were generally shorter than Chinese and Indian children, and Indian children were generally lighter than Chinese and Malay children. The study also proposed defining overweight and obesity at the 90th and 97th centiles on the BMI chart respectively.

The growth charts developed from this study are used across Singapore to monitor the growth of young boys and girls, aged between 0 to 72 months, based on their BMI, head circumference, height and weight.

About the researcher
Dr Shanta Emmanuel joined the healthcare industry in 1970 and is the first CEO of NHGP when it was incepted in 2000. She was also an associate professor at the National University of Singapore. During her term as NHGP’s CEO, Dr Emmanuel helped build a culture of quality in the young organisation by developing systems that facilitate continual improvement in clinical and service standards. She laid the foundations for the organisation, propelling the organisation towards transforming primary care, benefiting patients in the community. She stepped down as NHGP’s CEO in June 2005 and retired from the industry in 2012.
**Care for the Elderly Course**

Conducted by experienced registered nurses to equip you and caregivers with the skills to care for the elderly, this training programme will enhance your caregiving skills in providing excellent care to your loved ones.

The course covers:
- Hygiene and grooming
- Feeding
- Waste handling
- Communication
- Safety

**Date**
25 June 2015

**Time**
10am – 5pm

**Venue**
Primary Care Academy Learning Centre
Choa Chu Kang Polyclinic Level 3
2 Teck Whye Crescent
Singapore 688846

**Course fee**
$117.70 (inclusive of GST). Application for training grant is available!

**Email**
secretariat@pca.sg

**Registration**
Please call 6496 6683

**General Practitioner’s Assistant Course**

This course is specially designed for clinic assistants, with the aim of helping to raise service level.

The course covers:
- Use of medical terminologies at work
- Basic anatomy and physiology
- Principles of autoclaving and sterilisation
- Management of asthma
- Administration of medication via nebuliser
- Educate and administer medication via inhaler (Metered Dose Inhaler, Turbuhaler and Accuhaler)
- Application of eye and ear drops
- Dispensing skills by a pharmacist

**Date**
27 and 28 August 2015

**Time**
1.30pm – 5pm

**Venue**
Primary Care Academy Learning Centre
Choa Chu Kang Polyclinic Level 3
2 Teck Whye Crescent
Singapore 688846

**Course fee**
$342.40 (inclusive of GST). Application for Skills Development Funding (SDF) is available!

**Email**
secretariat@pca.sg

**Registration**
Please call 6496 6683

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