

Project Title

Implementing the Next Generation Electronic Medical Record for National Healthcare Group Polyclinics (NHGP)

Project Lead and Members

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Organisation(s) Involved

National Healthcare Group Polyclinics

Healthcare Family Group(s) Involved in this Project

Allied Health, Healthcare Administration, Medical, Nursing, Pharmacy

Applicable Specialty or Discipline

Healthcare Informatics

Aims

In this article, we take a deeper dive into NHGP's NGEMR journey that started three years ago.

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Conclusion

See poster appended/ below

Additional Information

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Project Category

Technology

Digital Health, Telehealth, Tele-Collaboration

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Job Redesign, Digital Workforce, Workforce Performance, Workforce Productivity

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Implementing the Next Generation Electronic Medical Record for National Healthcare Group Polyclinics

2020 saw the introduction of the Next Generation Electronic Medical Record (NGEMR) into public healthcare, with JurongHealth Campus being the first to usher it in. Queenstown Polyclinic was the next to have it implemented – along with a complete change in all their IT systems – before the rest of the National University Polyclinics followed suit (*see April 2020's and Dec 2020's HealthTech Connect respectively for articles on the transitions*).

NGEMR
INTEGRATED • INCISIVE • INNOVATIVE

Earlier this year, NGEMR continued its implementation journey, with successful go-lives at Geylang Polyclinic in February and the rest of National Healthcare Group Polyclinics (NHGP) – Ang Mo Kio, Hougang, Toa Payoh, Woodlands and Yishun – in May.

Transiting to NGEMR is necessary as the current IT landscape in NHG and NUHS comprises **more than 190 connected systems** which have been added progressively since 1998. The evolution of technology over the years has led to a variety of standards, causing some interoperability issues and hampering meaningful exchange of clinical data at times.

**OVER
190
CONNECTED
SYSTEMS**

When NHG and NUHS come fully onboard NGEMR in 2023, both clusters will have a single unified EMR for all their providers. NGEMR records the entire patient journey from the point of admission to discharge, taking in both medical and administrative data. This allows for a seamless patient experience, increased collaboration between healthcare professionals, and stronger patient empowerment and participation.





Complete Change of IT at Geylang Polyclinic

The Geylang Polyclinic go-live was especially complex, **as it involved a change in the entire IT landscape from SingHealth systems to the NHGP suite of systems.** Geylang had retained SingHealth systems when it became part of NHG during a nationwide reorganisation in 2017. The switchover was a significant exercise with almost every IT component changed, massive migration of terabytes of data, as well as the introduction of 22 new IT applications.

This was not the first time such a complete change of technology had happened. Queenstown Polyclinic went through a similar exercise last year. Having that experience under the NGEMR team's belt placed them in good stead. Despite Geylang being a much busier site, with double the patient volume and a large number of walk-in patients on Day 1 of go-live, it reported 20% less incidents and no priority 1 incident.

By the end of the fourth day of the transition, all departments at Geylang Polyclinic had reported a status of "green" (as opposed to amber or red) to signify that they were managing well.



The group of five NHG Polyclinics that went live together in May also fared very well. At the end of Day 2, super users at all five polyclinics reported their status as 'green'.

In this article, we take a deeper dive into NHGP's NGEMR journey that started three years ago.



The NHGP NGEMR Journey

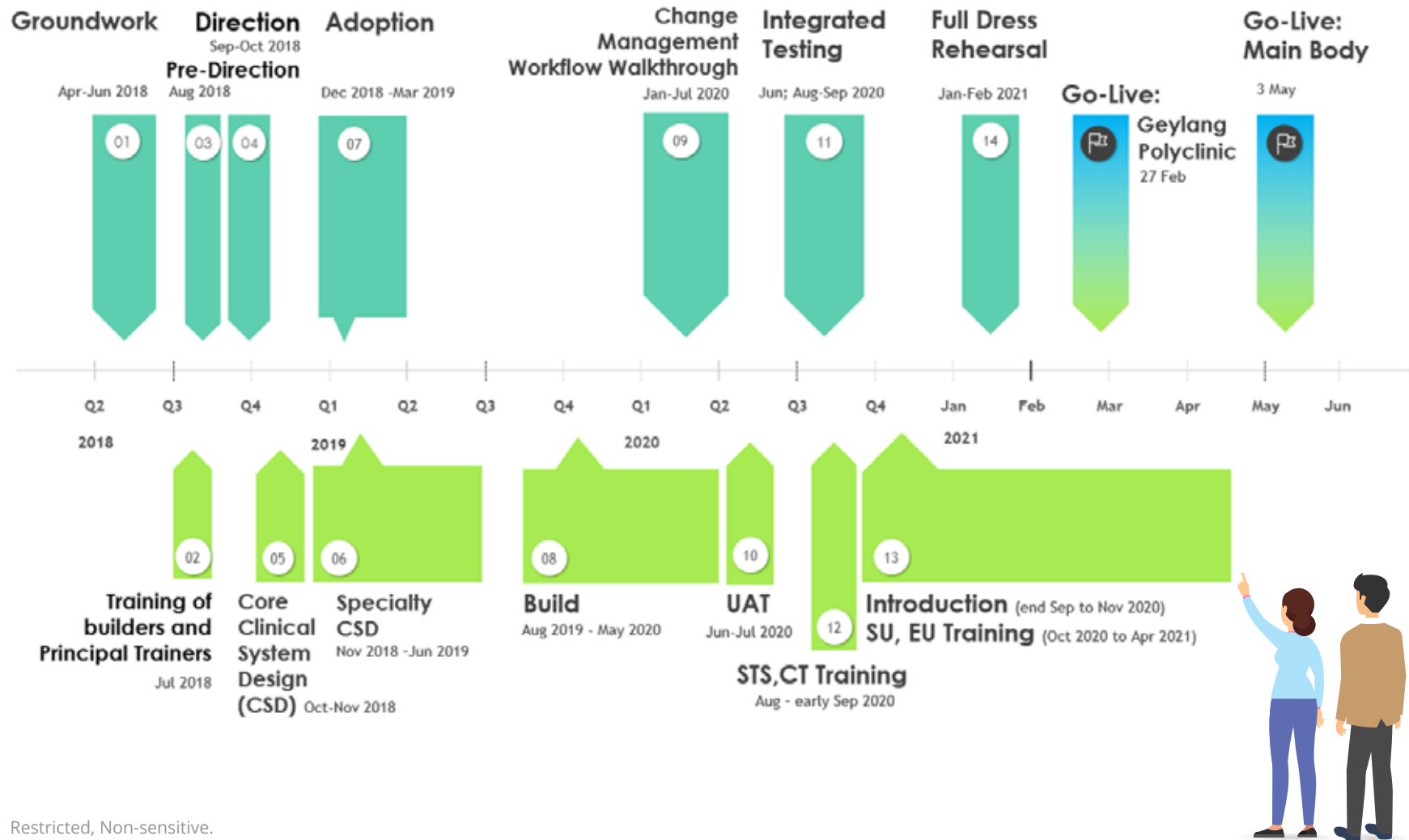
NHGP successfully implemented the NGEMR at **Geylang Polyclinic on 27 February 2021** and at the remaining Polyclinics at **Ang Mo Kio, Hougang, Toa Payoh, Woodlands and Yishun on 3 May 2021.**

Development of the NGEMR at the National Healthcare Group Polyclinics (NHGP), NHG Pharmacy (NHGPh) and NHG Diagnostics (NHGD) involved building the NGEMR, the new Queue Management System, enhancement of the system used for clinical and operational reports, integration with the pharmacy system and integration of Electronic Collection Module (ECM) with Epic to replace the previous specimen collection module in cDOC/CPSS2.





NHGP NGEMR Timeline



Development

NGEMR: Clinical System Design, Adoption, User Acceptance Testing and Integrated Testing

The NGEMR Journey at NHGP, NHGPh and NHGD began in 2018 with senior management team being involved in project planning and review of groundwork analysis between April and June 2018. This was followed by pre-direction and direction sessions between August and October 2018 where project plans were finalised and key performance indicators set. In July 2018, 11 staff underwent training and were seconded to help oversee development and implementation of the NGEMR in various capacities as NGEMR trainers, workstream leads and process analysts.

From September 2018 to June 2019, about 100 Subject Matter Experts (SMEs) from the Clinical Services, Nursing Services, Allied Health Services, Operations Division, Finance, Health Promotion and Preventive Care, Clinical Research Unit, Care integration and NHGPh and NHGD met weekly to discuss workflows, and together with counterparts at the National University Polyclinics participated in requirement gathering in clinical system design and adoption sessions. Input was also obtained from Dental Services.

The building process took place from July 2019, culminating in Integrated Testing in June and August 2020 and User Acceptance Testing (UAT) in June and July 2020.



NGEMR for NHG Polyclinics

Queue Management System

The new Queue Management System (QMS) plays a vital role in supporting the efficient management the patient journey within our polyclinics. Over and above the functionalities of the existing queue management system, the Operations division took the opportunity to **build new features** to better serve the needs of our staff and patients:



Neatly organised queues placed into categories ('active', 'missed', 'on hold', 'return') in accordance to patient's queue status, with patient's itinerary clearly presented on a personalised journey map for easy reference



Priority patients who require urgent care being listed at the top of the queue so that service providers will be alerted to attend to them promptly



Availability of patient profile notes at visit level or specific service station to make known the needs of the patient to other service providers



Availability of "locate" tab which allows service providers to do a quick search the patient's journey status and make real-time changes the patient's itinerary

Training and Change Management



NHGP has been on full electronic medical record system since 2009, having used other simpler EMRs in the early 2000s. During requirement gathering and building, SMEs observed significant differences between NGEMR and CDOC/CPSS2 in several areas. As part of system familiarisation and change management framework, NHGP highlighted changes in workflows to help staff prepare.

From August 2020 to early September 2020, 92 staff from NHGP, NHGD and NHG Pharmacy completed training as NGEMR trainers. They in turn conducted introductory sessions from end September 2020 to a group known as super users as well as regular end users to help them understand the basic functions of NGEMR. This was followed by further structured training sessions for the users at Geylang Polyclinic and subsequently at the other five polyclinics. Those who completed training earlier also attended revision sessions. **A total of about 1200 users completed training on more than 1600 tracks/topics by mid-April 2021.**

From December 2020 to early April 2021, the users also participated in login sessions to check that they had been assigned the correct templates. Doctors also customised their preference order lists and SmartPhrases (*pre-configured phrases for various disease conditions*) to speed up documentation during consultation.



Change management workflow walkthrough sessions involving SMEs, and process and change management owners were **important preparatory activities to help users understand changes in workflows, identify the impact, work through mitigating factors and manage the changes.** These owners, many of whom were also trainers, Nurse Managers and Operation Managers, engaged and hand-held the users in preparation for NGEMR Go-Live.

Full Dress Rehearsal and Downtime Rehearsal

The Full Dress Rehearsal (FDR), which was done with key representatives from all the NHG Polyclinics, mimicked the patient's journey from one station to another station (e.g. from registration kiosk to consultation room, pharmacy and payment kiosk). The FDR scenarios drafted with the help of SMEs, included testing of cross-day workflows. Testing was also done for related functions (e.g. registration, queue management, pharmacy, laboratory and radiology) and support communication (NGEMR Command Centre & Contact Centre).

Downtime FDR was also carried out on 7 Feb 2021 to test business continuity. This included review of all existing NHGP institutional policies, work instructions and briefing of users on the Epic Downtime tools.

Verification and Validation before Go-Live

Final verification by the users was done on 26 Feb 2021 for Geylang Go-Live and on 1 May 2021 for the rest of the NHG Polyclinics. Users tested the workflows and the system build in actual production environment. The NHGP and IHiS leadership teams approved the launch of NGEMR at NHGP after final validation by the users.



Go-Live

The Go-Live at pilot clinic, Geylang Polyclinic, took place over three days, with the cutover completed on 26 February, Soft Launch (with pilot workflows) on 27 February and Full Launch on 1 March.

The CIOO team worked closely with colleagues from NGEMR team, infrastructure team and vendors. Intense preparation was done with table top dry runs to simulate all possible contingency scenarios. **The end result was a seamless execution of migration on the cutover night with military precision, completed two hours ahead of schedule.** The entire cutover exercise was akin to setting up a new polyclinic with new network, EUC devices, kiosks and all applications within 10 hours overnight.



With support from IHiS and Epic team members, patient safety / clinical, finance and operations huddle sessions were conducted every afternoon during the first few weeks of Go-Live. These sessions were used to resolve time-sensitive teething issues such as network issues and request for enhancement to smoothen out workflows. For example, the time taken for order to flow from NGEMR to ECM was significantly reduced after IHiS analysed and revised the logic with Epic and NHGD LIS team.

Floor Support comprised NHGP's NGEMR trainers, super users and Principal Trainers (Epic staff, remote or on-site) and IHiS from the Command Centre. Prior to Go-Live, the Corporate Communications and Care Integration teams communicated with neighbouring GP partners on impending NGEMR implementation. Members from headquarters



helped with crowd control by screening incoming patients and advising those with suitable conditions to visit their nearby private family doctors instead of the polyclinics during the first week of implementation.

From mid-March to mid-April 2021, about 150 users from various clinics were sent to Geylang Polyclinic to familiarise themselves with the use of NGEMR as well as the issues encountered. This enabled them to support their colleagues during subsequent Go-Live in May 2021 at the remaining five polyclinics. The latter went smoothly, with cutover and final verification taking place during the Labour Day weekend holidays. The polyclinics started serving patients on 3 May 2021 (full launch) and staff were able to function fairly independently by the third day.

CHALLENGES

COVID-19

One of the key challenges faced was training and implementation of NGEMR amidst the COVID-19 outbreak with the polyclinics having to continue patient services at the polyclinics while seconding healthcare providers to set up and run Community Isolation Facilities, swab test stations and Vaccination Centres.



From February 2020, all developmental work and change management workflow walkthrough sessions were done remotely. Training was conducted largely virtually, with small groups of hands-on clarification sessions and final training conducted by trainers based at the same polyclinics as users.

Medication

Prescribing was identified as an at-risk activity as clinicians had to familiarise themselves with new features in NGEMR and transcribe medication from legacy records. There were frequent engagement sessions between Medication Management and Utilisation Committee (MMUC), NHGP and users on training and workflow mitigation to reduce the risk of errors.



During the daily patient safety huddles, analysis of patterns of prescribing intervention was done, highlighting systemic root causes which were then resolved by re-education or changes in NGEMR. The partnership and continuous feedback between doctors, nurses and pharmacists within every branch allowed rapid discovery of loopholes and swift resolution.

Restricted, Non-sensitive.

Conclusion and Acknowledgement

NGEMR is a unified EMR which enables healthcare providers to deliver holistic, comprehensive, timely, safe and seamless care as the patient transits from primary care to restructured hospitals and community hospitals and vice versa.

NHGP and IHiS would like to express heartfelt gratitude to MOH, NHG, NHGP Senior Management, Epic, NUHS and IHiS sub-teams for the guidance and teamwork. We would also like to thank the SMEs, trainers and super users who contributed in many ways in developmental work, administrative support and training and end users who valiantly embraced the NGEMR while maintaining patient services especially during COVID-19 outbreak.

Lastly, we thank The National University Health System's Chief Information Officer's Office (NUHS CIOO) for their instrumental role in smooth implementation as they generously shared their experience and learning points from their go-lives in 2020 with the NHG teams.

THANK YOU!



NHGP has marked a significant milestone with the successful rollout of NGEMR across our six polyclinics. I would like to thank everyone involved for your support during this 3-year long journey. This important step was made possible due to the hard work, dedication and resilience in implementing this new system, despite us being in the midst of a pandemic.

Our transition to NGEMR will certainly put us in a more advantageous position to harness and integrate digital technology into our healthcare delivery model for more efficient patient care management.



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