

Asia Pacific Electronic Health Records Conference 2016, Hong Kong

6 July 2016

Sharing Singapore's Experience on the National Electronic Health Record

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CMIO

Ministry of Health/MOH Holdings



eHealth Systems in Singapore in early 2000

Multiple EMR Systems Multiple Lab & Radiology Systems

- Public healthcare clusters
NHG and SingHealth hospitals, polyclinics and specialist clinics
- Ministry of Defence (MINDEF)

EMR Exchange (EMRX)

Hospital based EMR & CPOE

National Immunisation Registry

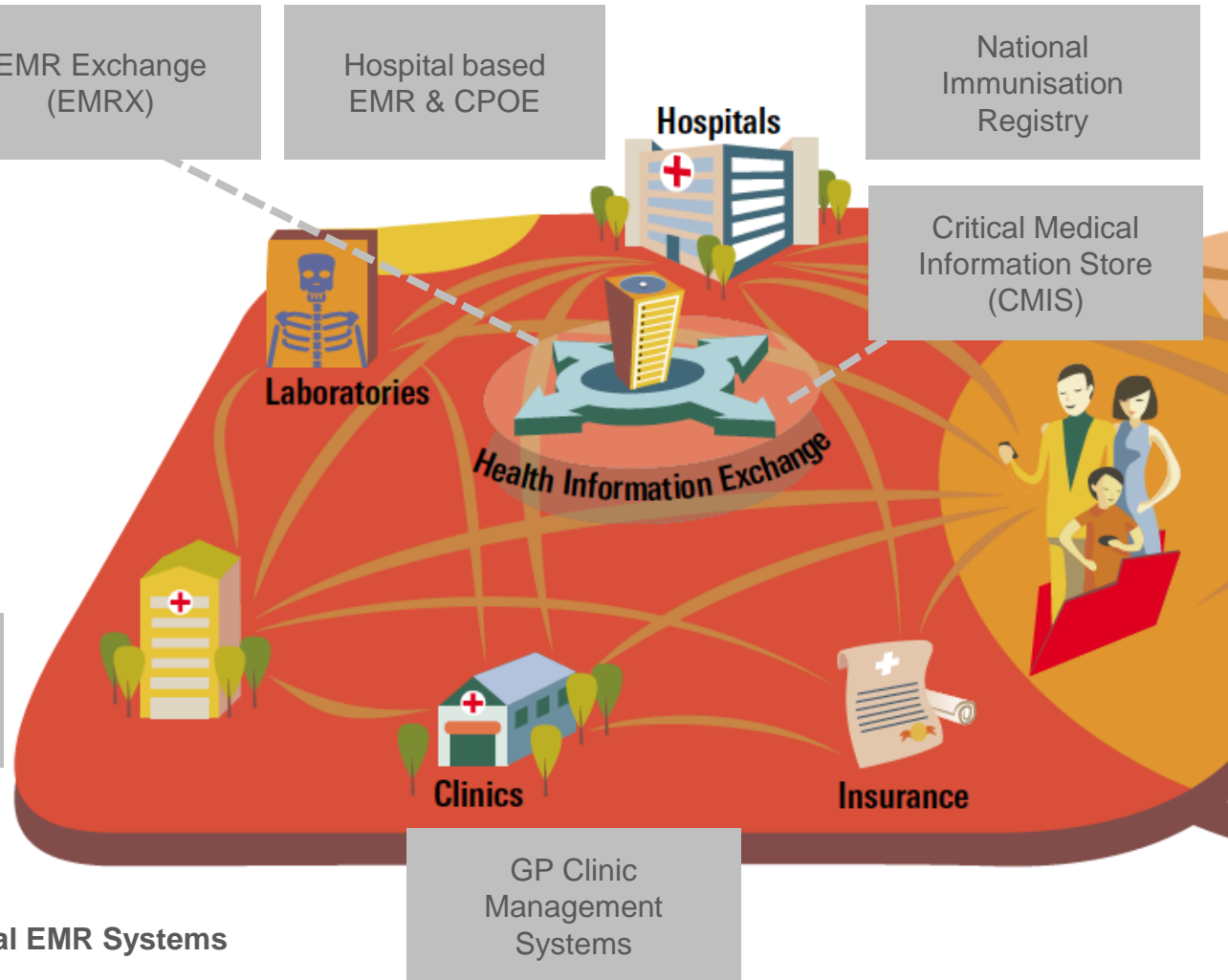
Critical Medical Information Store (CMIS)

EMRX Extension to Community Hospitals

Community Hospital based EMR

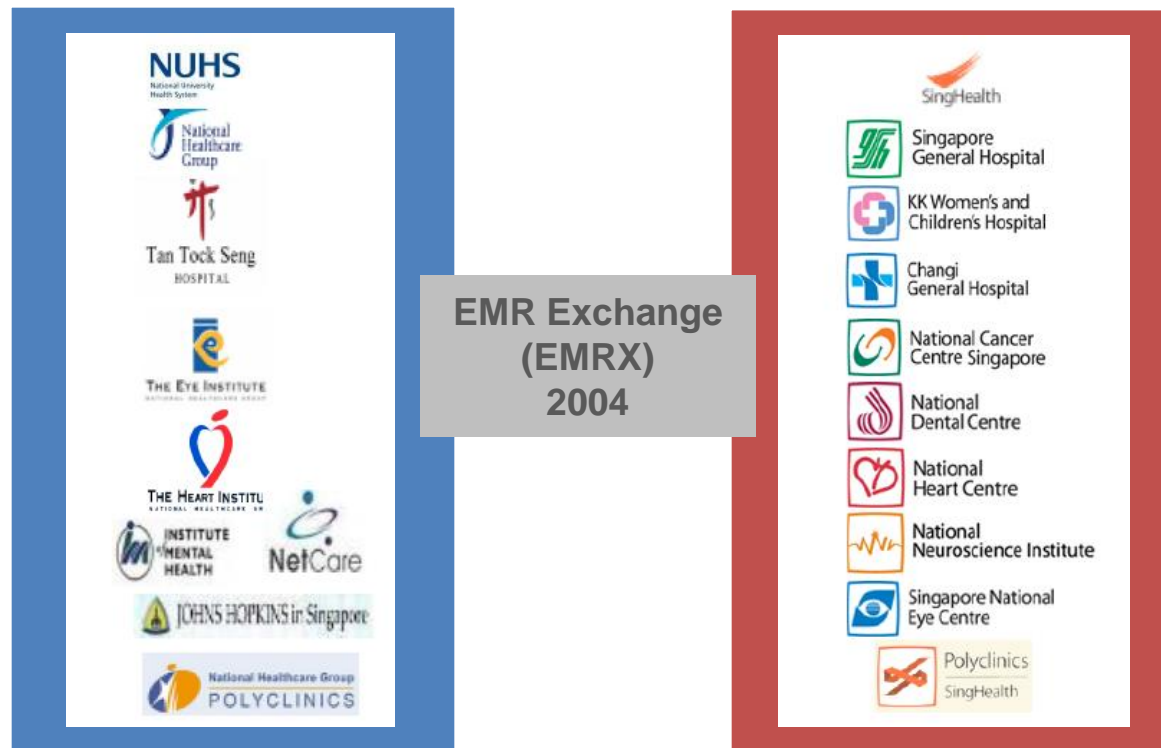
Minimal EMR Systems

GP Clinic Management Systems



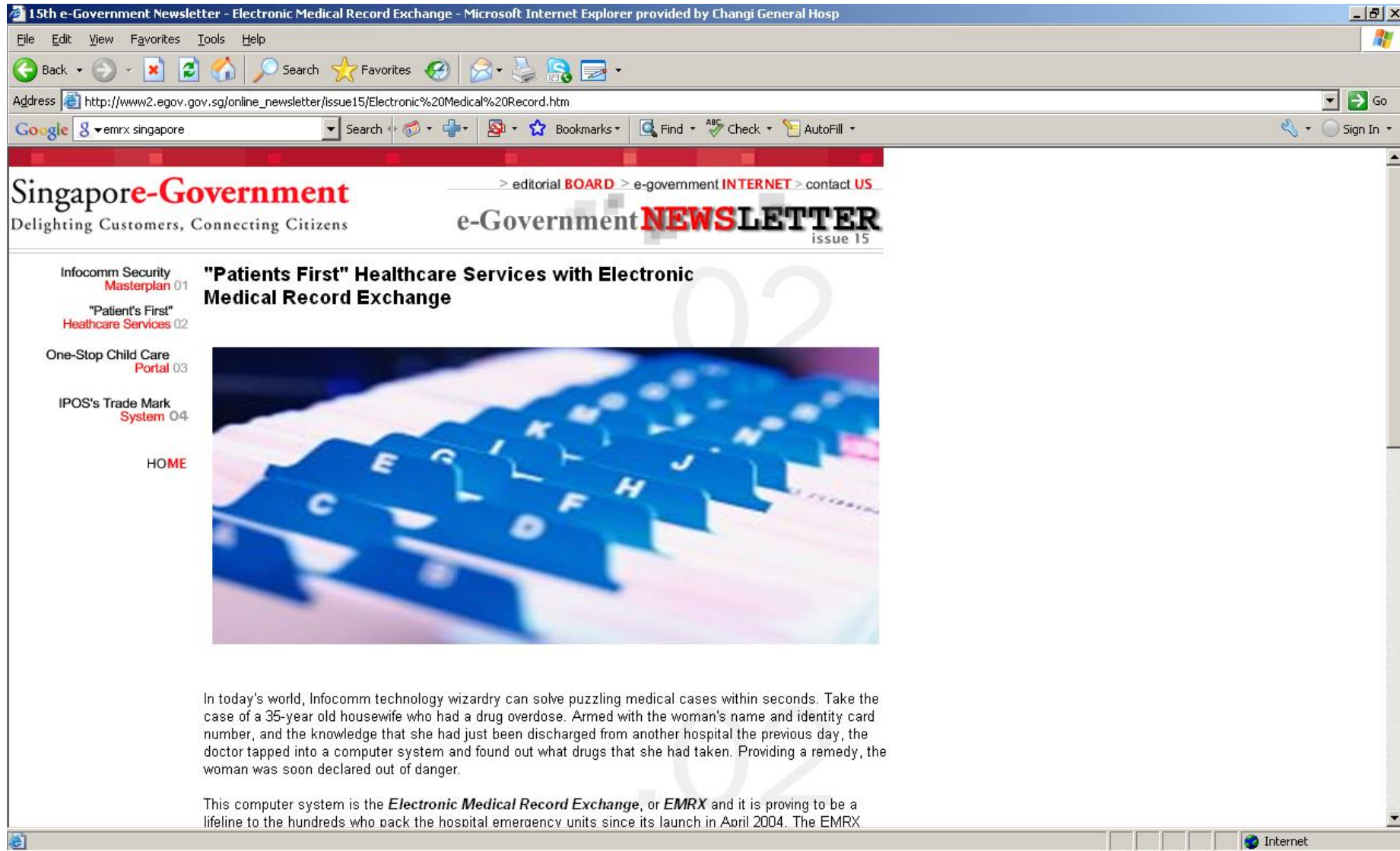
- Private GPs (over 400 out of more than 2,000 have a CMS)
- Community Hospitals and other ILTC providers

Hospitals and polyclinics integrated into 2 cluster with 2 different IT Systems 2000-2004

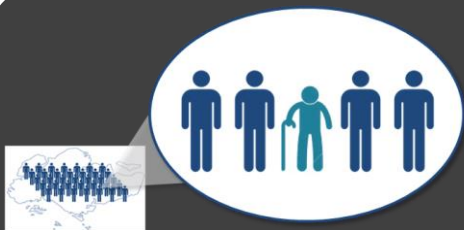


EMRX is use to facilitate the data sharing between the 2 Clusters

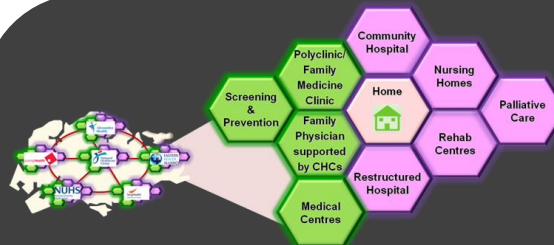
2004 EMRX – EMR Exchange



The NEHR was created as a strategic long term enabler to support care delivery for both healthcare providers and citizens.



- Growing population
- Ageing population
- Increase in burden of care for chronic diseases



- No means to share data across different care settings or even between different acute settings
- Low IT maturity outside of RHS
- Lack of patient centricity

“What does it mean when we say our population will be older? It means there will be more demand on healthcare because older people are sick more often.

But this also means it is a different pattern of healthcare

So we have to respond to this by putting in more resources into our hospital system, building new hospitals.

... get the whole system to be structured properly so that it will be adapted to cater to the ageing population. To structure it properly means we need step-down care.”



Picture taken from asiaone.com

“And one key thing we must do with this step-down care is to link up our acute hospitals [...] with community hospitals, so that you can have the best of both worlds.”

*Prime Minister Lee Hsien Loong
National Day Rally 2009*

National Electronic Health Record (NEHR)

Vision of *“One Patient, One Health Record”*

The EHR is an integrated healthcare record centered on each person. It extracts and consolidates in one record, all clinically relevant information from their encounters across the healthcare system throughout his/her life

**Secure “real-time” access to patients’ EHR
by authorised clinicians and healthcare providers:**

- > enable greater coordination and informed decision-making;**
- > resulting in more accurate diagnosis, better treatment and patient-centric integrated care**



EMR vs EHR

EMR

Specific to a facility
(institution, private office)

- Equivalent of its paper predecessor
- Includes everything recorded by the organization about a given patient
- Has “depth” but lacks “breadth”

EHR

Specific to an individual

- Captures a key subset of health information from multiple point-of-service systems
- Available electronically to authorized healthcare providers anytime, anywhere
- Designed to facilitate the sharing of data across the continuum of care, across healthcare delivery organizations and across geographies

Healthcare Demand Changes and Growing

Home » Business » Healthcare

Partners gets \$12.3M to advance genomic medicine



#4

Advances in
Medical
Technology



#1

Demographic
Changes

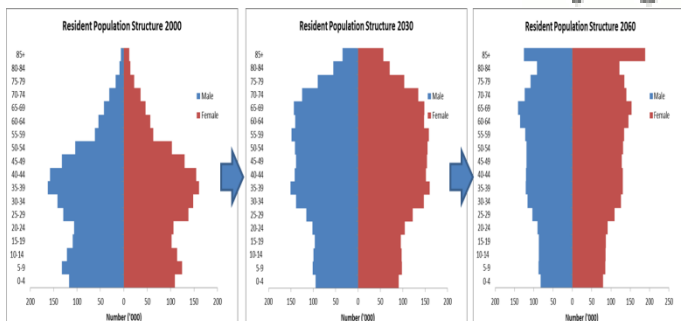


#3

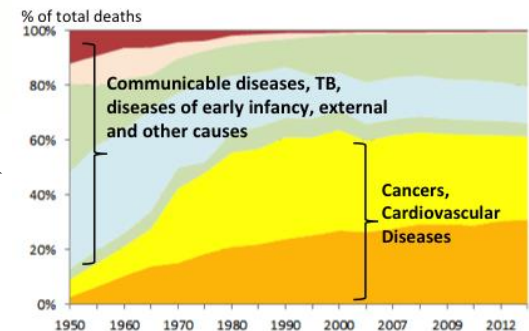
Changing
Social
Compact &
Rising
Expectations

#2

Changes in
Disease
Patterns



*Ageing, smaller families, rising
singlehood*



More chronic conditions

Further shifts in Healthcare needed

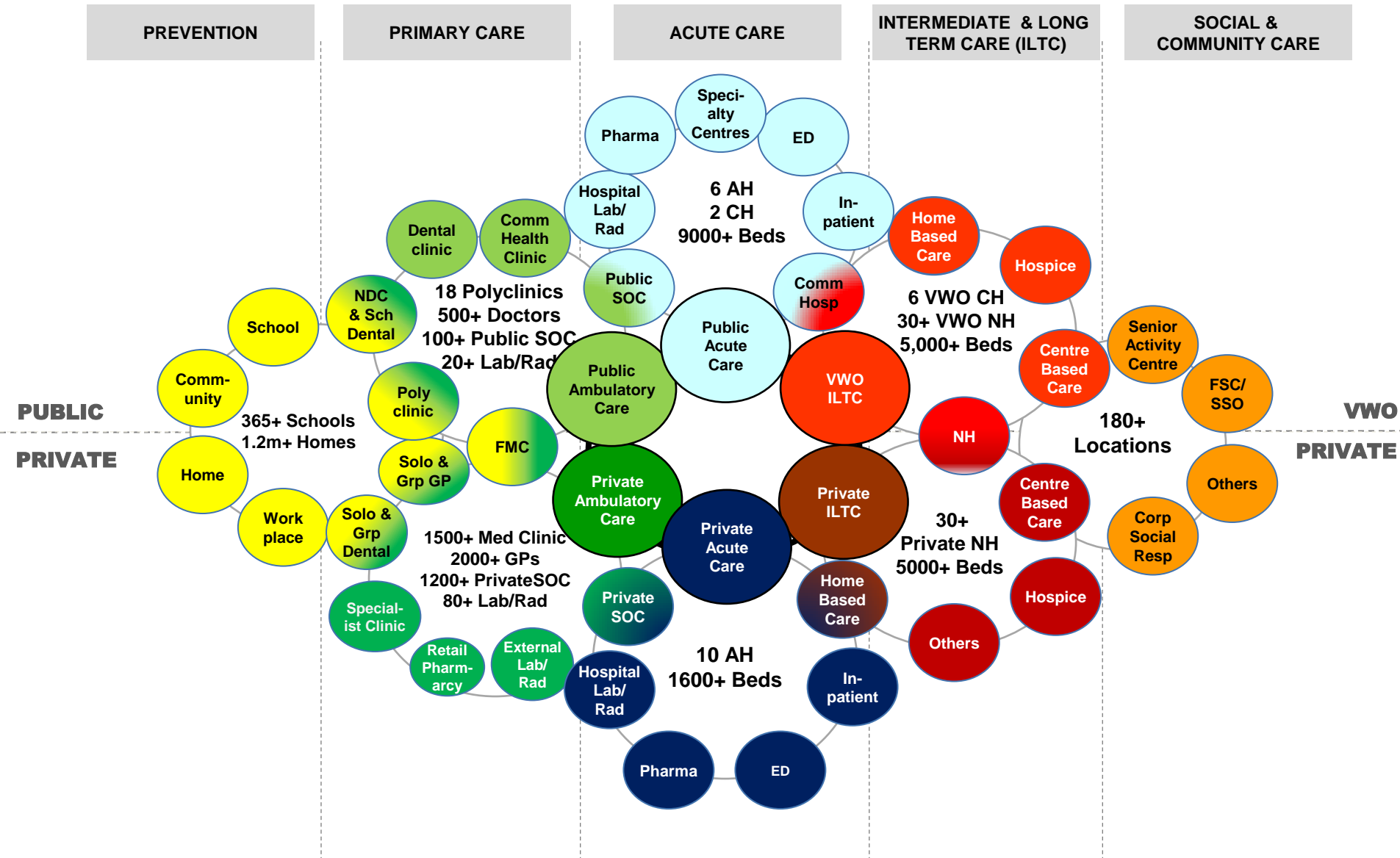
- To **transform models of care**
 - From being institution-centric/ acute-focused to be patient-centric, providing appropriate cost effective care at the right setting
 - Find ways to increase manpower productivity
- To deepen **partnerships and collaborations with private sector** across the care continuum
 - E.g. Across primary, acute hospital, ILTC settings
 - to **add value** to overall healthcare system and meet national healthcare needs including for subsidised patients
- To strengthen coordination of six RHSes to serve as **one Public Healthcare System**
 - E.g. common IT platforms for synergies and economies of scale



Singapore Healthcare Ecosystem

Complex & inter-connected.

Many opportunities for Public/Private partnerships

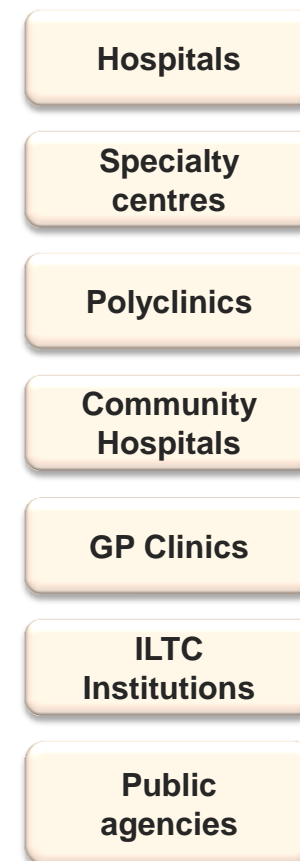
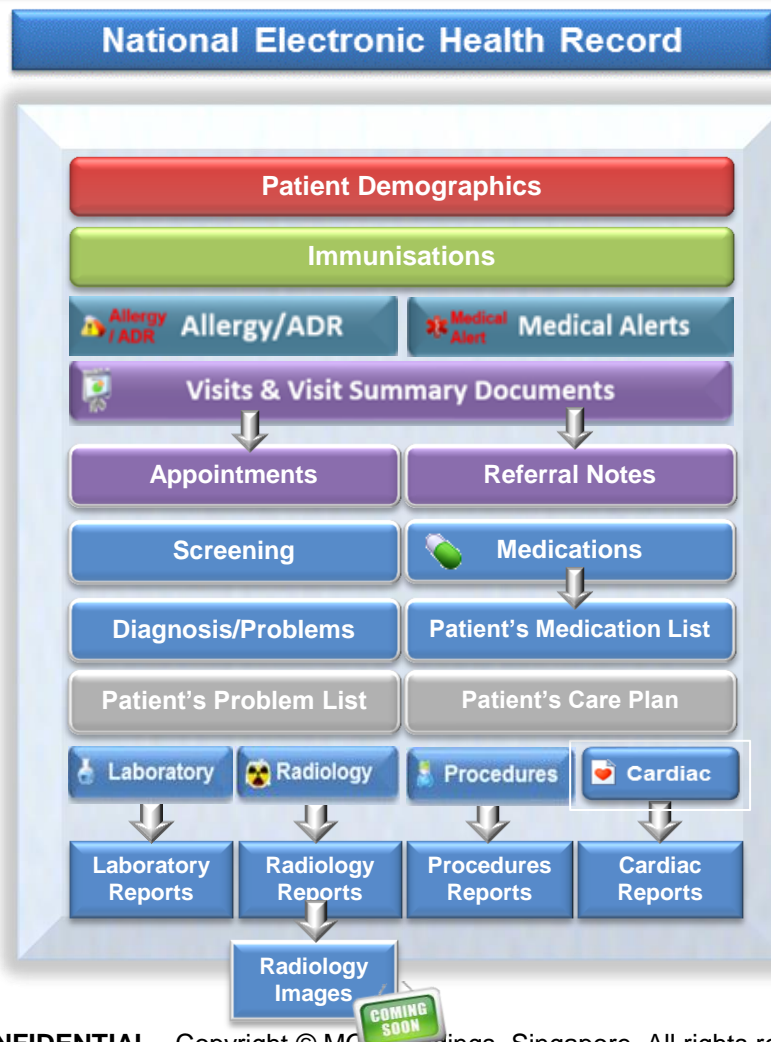


NEHR is evolving from capturing of summary record to continuity of care record (CCR) so as to provide the necessary clinical information to facilitate care transitions.

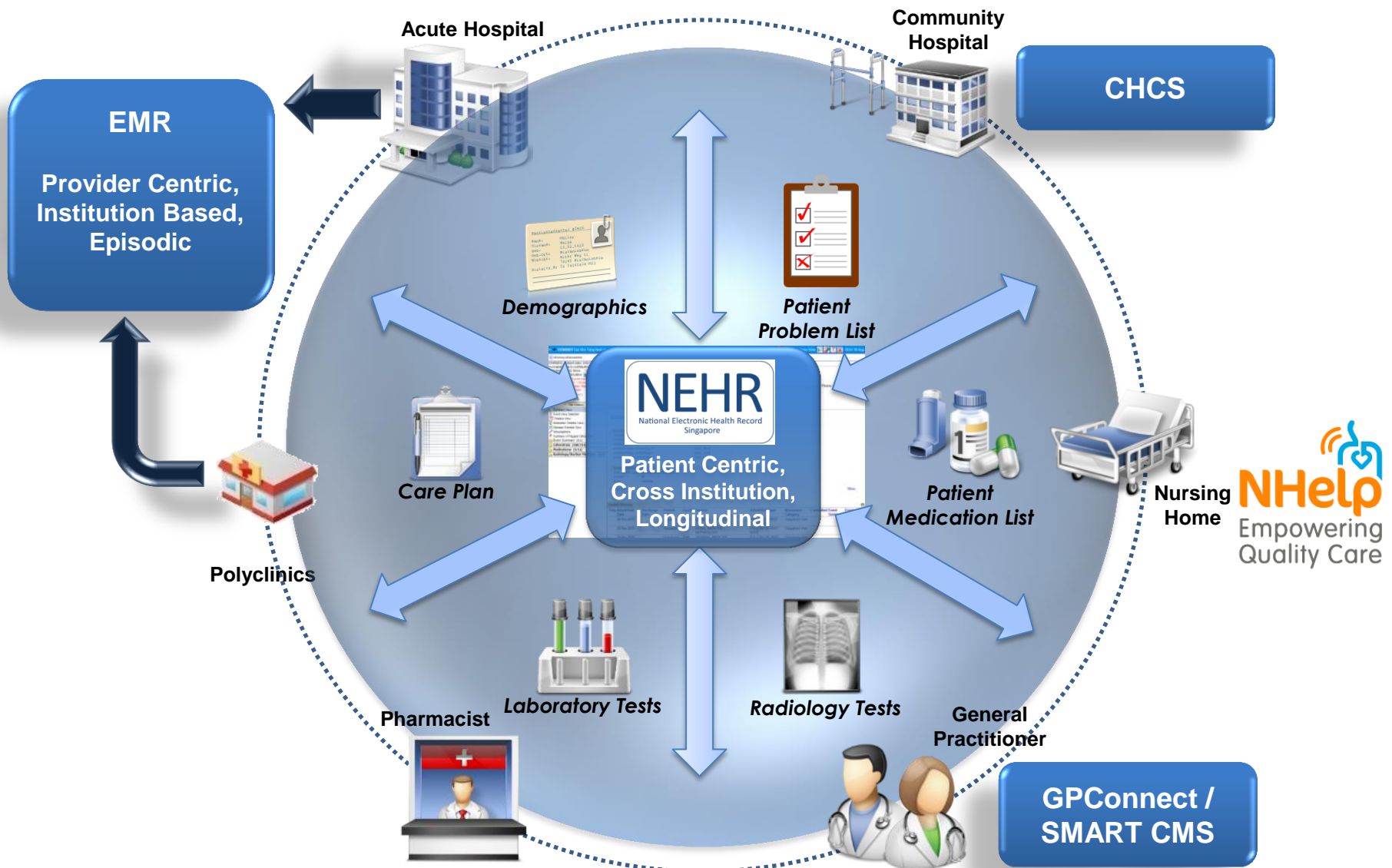
Data Sources

Capabilities

User Groups



NEHR facilitates the sharing of a summary care record from EMRs so as to have a comprehensive longitudinal care record for the patient.



The NEHR programme will be focusing to empower the citizen, provide greater meaningful information and functionality to the clinician and scale the architecture to deal with increased demand.



Connecting with the Patient

- Empowering patients to better manage their own health through the sharing of NEHR data with HealthHub, our National consumer health portal
- Extending strong, secure, user-friendly authentication services
- Supporting access through Telehealth capabilities
- Ease of access through federated appointment capabilities



Supporting the Care Provider

- Better integration of care through Continuity of Care Record and Care & Case Management System
- Information when it is needed through bidirectional information exchange and more data types (depth) and data source (breadth)
- Easier transfer of care with provider service registries and eReferral capabilities



Facilitating the Administrator

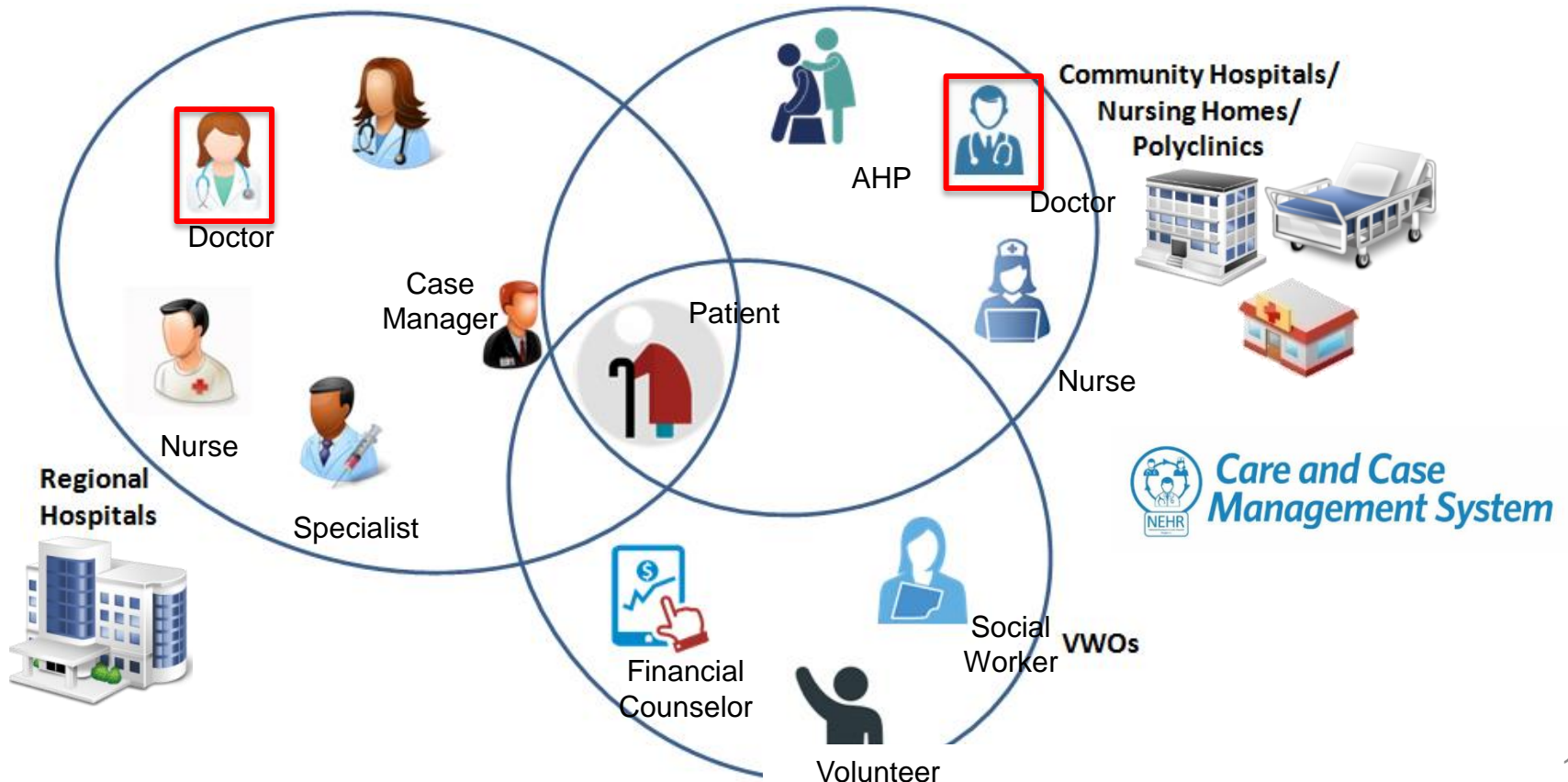
- Access to extensive, rich data sources to support insights into all aspects of healthcare delivery through the Analytics and Health Data Grid initiatives
- Economies of scale and more effective coordination through centrally delivered national initiatives such as authentication services and mobile capabilities.

Infrastructure, operational and security enhancements to support the diverse and expanding user base



Facilitates the sharing of information and supporting care of patients among ILTCs and community partners.

CCMS enables a **multidisciplinary approach** to clinical care, thus enabling **improved coordination among clinicians and care providers** across the continuum of care (including the community) and provides **care transformation from the traditional doctor-centric model to a team-based, patient-centric model** while facilitating **community-based care** as well .





Frequent Admitters, Chronics, Living Alones



Clients in the community



Case Manager /
Care Coordinator



Identified
Client



Enroll
Client



Perform
Assessment

Clinical and economic
evaluation of health care



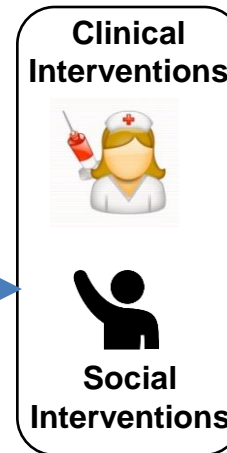
Identify
Problems

- Dementia
- Fall Risk
- Depression



Identify
Interventions

- Drugs
- Therapy
- Befriending



Clinical
Interventions

Social
Interventions

Create Care Team
&
Assign Tasks



Team member
delivers
the care



Update
MDN
Notes

Business Services



Client Management



Assessments



Manage Care Plan



Manage Tasks



Manage Care Team



Access Management Audit Trails & Reports



Messaging



Volunteer Management



MDM Notes

Data From external systems

Lab Results

Medications

Diagnosis

Referrals

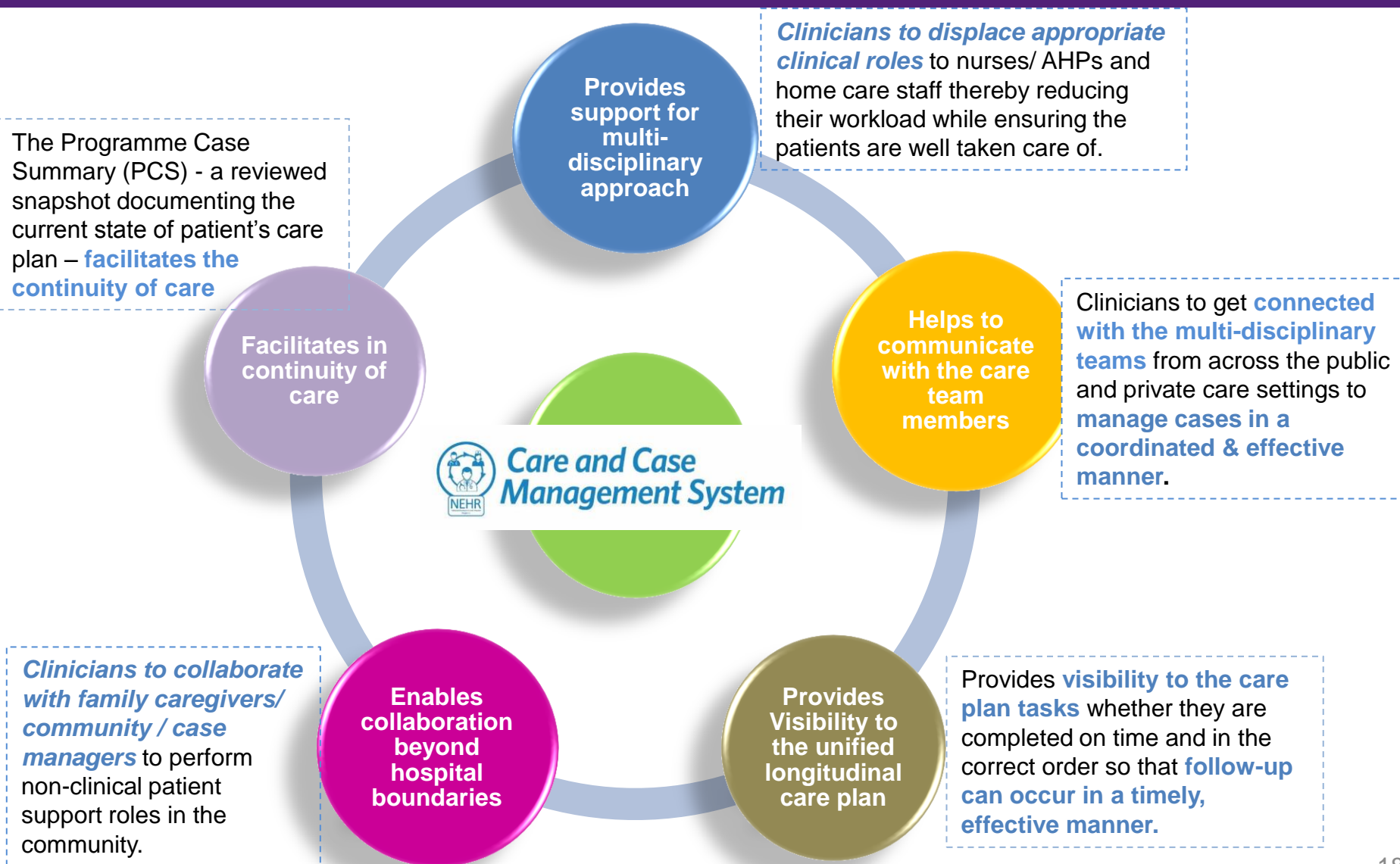
Demographics

Visits

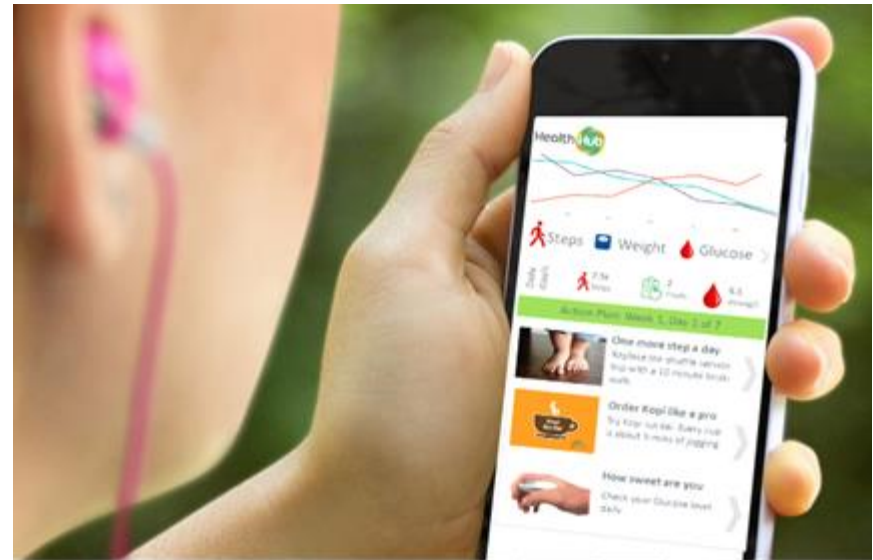
Appointments

Radiology

Advance Care Plans

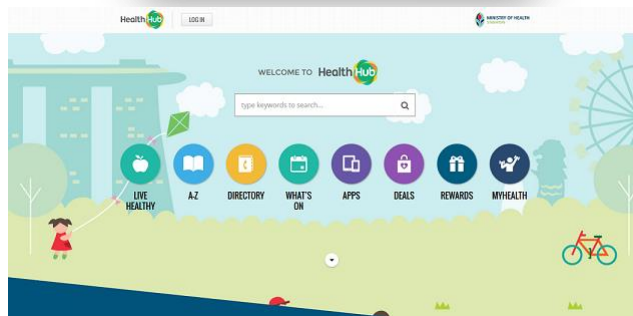


Harness information using technology to provide Singapore population with access to essential health content and services to help them in the care and management of their health and wellness





HealthHub gives patients access to selected portions of their medical records thereby allowing clinicians to engage the patients in managing their health better.



Health & Wellness content



Wellness programs



Directory of healthcare facilities



Medical A-Z, healthy living

Patient's Health Records



Hospital discharge summary



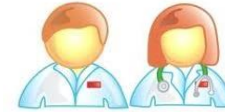
Lab results for Chronic Disease



Health screening record (HPB)



View their medical appointment



What does this mean to the clinicians?



Clinicians can now **share health information** (e.g. condition specific health articles, health results) with patients easily.



Clinicians **can empower patients to monitor and manage their conditions** - patients to share their health information with the clinicians through HealthHub in future.



Clinicians can **develop new services for delivery of care** that will allow patients to be engaged through HealthHub so that they can be better managed in the community / home.



Healthhub – A digital health companion

Integration of content & services to influence health behaviour & simplify interaction with health service providers

MOH HOLDINGS

Content & Services

Health Content

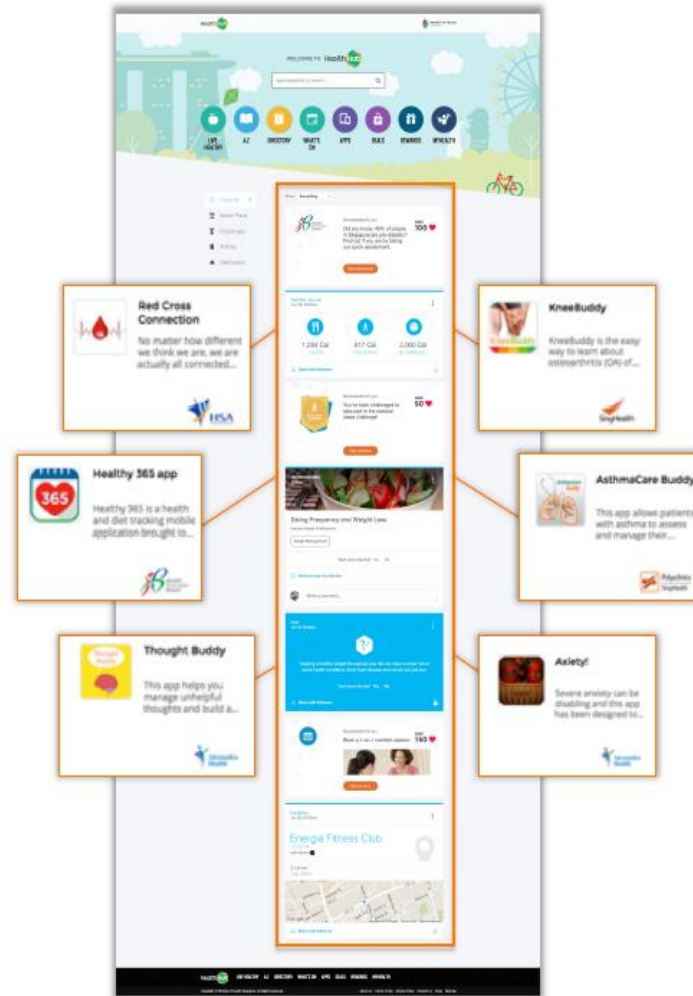
Trusted source of information, tips and advice

Health Services & Navigation

Locate health services, facilities & healthcare professionals from one place

Health Admin & Finance

Single point of contact to various health service transactions



Personal Health Records

Simplified access to individual and dependent's health records

Personal Health Management

A gateway to personal health monitoring and management programmes

Communities & Marketplace

Source of community support and care services

Clinicians are empowered by Nursing Home IT Enablement Programme (NHELP) IT system to provider better care to the nursing homes residents

Ability to maintain problem list specific for nursing care (such as activity of daily living and diagnosis) for follow through

Built in variety of standard assessment tools for care assessment of an admitted resident electronically

Maintain electronic clinical documentation that includes assessments, observations, progress notes etc.

Facilitate the administration of medication and capture adverse drug reaction electronically

Support multi-disciplinary assessment and review through the system

Auto reminder to clinician to create care plan for a resident within 72 hours upon admission

Track and update care plan based on residents' medical progression electronically.



Assign or deactivate an infection tag to a resident

Ability to retrieve summary view of basic clinical information (e.g. demographic, assessments, allergies, wounds, infection, incidents etc) real time.

Ability to generate reports electronically instead of looking through all the paper documents to analyze data

Auto notification to clinician on medication review if it is not initiated within 48 hours after resident's admission to the nursing home

Prescribe and manage clinical orders (such as diet, lab tests, medication orders etc) electronically.

Some sample features of GPConnect to improve clinic's operation and enhance GP's clinical care

Clinic Management System	Electronic Medical Records	
<ul style="list-style-type: none">• Registration• Medication Dispensation• Results & Referrals• Billings & Payments• 3rd Party Claims• Clinic Administration	<ul style="list-style-type: none">• Doctor's Queue Log• Patient's Records & Notes• Referrals & Medical Certs• Prescriptions• Immunisation	<ul style="list-style-type: none">• Lab Results• 2-way Update to CMIS• Clinical Entry Set• Prompt to Notify Infectious Diseases• Chronic Management Templates
Common Functionalities		
<ul style="list-style-type: none">• Data Archival• Support Mobility• Roles & Access	<ul style="list-style-type: none">• Patient's Drug Allergy History• Search Functions	<ul style="list-style-type: none">• Integration with National Systems• Offline Capabilities

Thank You



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