A Framework and Working Model for Integration of Care:
Bridging gaps between tertiary, secondary and primary care settings

26 August 2011
Dr Jason Cheah
CEO, Agency for Integrated Care (AIC)
Singapore
A Greying World

- Medical advancement and higher standard of living have led to an increase in average lifespan

- The incidence of chronic disease increases in tandem
A Greying World

Decreasing Fertility Rate + Increasing Life Expectancy = Ageing Population

Source: UN
In Singapore...
...with the population ageing rapidly, more people are remaining sick longer. Keeping them in acute care hospitals, which can cost around $900 a day, is becoming too expensive.
Problems are Compounded by an Ageing Population

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… this also means it is a different pattern of healthcare.

PM Lee Hsien Loong, National Day Rally 2009

Source: Singapore Department of Statistics (DOS), 2005

Source: Ministry of Health
Increasing Demand for “Step Down” Care

Note: The above data only covers subsidized patients referred to AIC.
Increasing Reliance on Institutional Support

Increasing Aged Dependency Ratio due to smaller family sizes

- 0.12
- 0.12
- 0.15
- 0.18
- 0.24
- 0.29
- 0.31
- 0.34
- 0.37
- 0.38
National Health Surveys - Prevalence of Cardiovascular Risk Factors among Singaporeans, aged 18-69 years


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>27.7</td>
<td>32.5</td>
<td>26.8</td>
<td>23.3</td>
</tr>
<tr>
<td>High Cholesterol</td>
<td>23.6</td>
<td>28.2</td>
<td>19.1</td>
<td>18.6</td>
</tr>
<tr>
<td>Diabetes</td>
<td>11.5</td>
<td>11.3</td>
<td>9.0</td>
<td>11.5</td>
</tr>
<tr>
<td>Obesity</td>
<td>5.5</td>
<td>6.3</td>
<td>6.7</td>
<td>11.2</td>
</tr>
<tr>
<td>Exercise</td>
<td>14.4</td>
<td>17.7</td>
<td>16.9</td>
<td>19.4</td>
</tr>
<tr>
<td>Smoking</td>
<td>18.1</td>
<td>15.1</td>
<td>12.3</td>
<td>13.9</td>
</tr>
<tr>
<td>Drinking</td>
<td>3.2</td>
<td>2.8</td>
<td>3.3</td>
<td>2.3</td>
</tr>
</tbody>
</table>
Increasing Prevalence of Chronic Diseases

Top 10 Conditions of Hospitalization

- Intestinal Infectious Disease: 2.2%
- Infections of Skin and Subcutaneous Tissue: 2.1%
- Chronic Obstructive Lung Disease: 2.5%
- Cerebrovascular Disease (including stroke): 2.3%
- Pneumonia: 2.5%
- Other Heart Diseases: 2.3%
- Obstetric Complications affecting Fetus or Newborn: 3.5%
- Ischaemic Heart Disease: 5.4%
- Cancer: 5.4%
- Accident, Poisoning & Violence: 10%

Source: MOH
CARING FOR THE ELDERLY –
Its complex

- Financial Issues
- Caregiver Issues
- Ageism
- Multiple providers
- Multiple Chronic Diseases
- Polypharmacy
- Handicaps/Disabilities
- Multiple Social Issues
Singapore’s Healthcare System
Healthcare delivery is provided by the public, private and people sectors.

Primary care provision
- 80% private GPs
- 20% Polyclinics in NHG and SingHealth

Secondary/Tertiary care
- 20% private
- 80% NHG and SingHealth

Continuing care
- approx 70% by people sector, 30% by private sector
- community hospitals, nursing homes, hospices, day care centres, renal dialysis centre

Wellness Care
- Mainly private sector
- Some public sector involvement e.g. HPB
Singapore’s healthcare financing philosophy

- **Ensure affordability of basic healthcare**
  - Heavy subvention, universal coverage for basic services, with access to higher levels of services based on willingness to pay

- **Instill individual responsibility**
  - Patients expected to co-pay part of medical expenses
  - Risk-pool for catastrophic illnesses, without undermining the need for individual responsibility and patients’ desire for choice.
Singapore’s Healthcare is Developed in Silos…

**Primary Care**
- Mainly Private
- Fee for service

**Acute Hospital Care**
- Mainly Government
- Per Episode Charging

**Intermediate Long Term Care**
- Mainly Voluntary Welfare Organisations
- Per Diem Charging
A Need for Change

With an ageing population and increasing demand on healthcare services...

1. Increase demand for acute care
2. Intermittent access to community services worsens health
3. Primary and ILTC services not well-integrated and undeveloped
4. Frequent readmissions

The hospital-centric model is no longer suitable and a more integrated healthcare system is required.
Summary of Challenges Faced by Singapore’s Healthcare System

- **Fragmented** patient journey resulting in less than desirable health outcomes and unable to move patients back to community/home

- **Ageing population**
  - Increase in prevalence of chronic diseases
  - Increase demand on Intermediate and Long Term Care sector

- If challenges are not addressed, health outcomes will be compromised and escalation of healthcare cost for all Singaporeans
How Care Integration could be the solution....
Integrated Care

What is integrated care?

- **Patient centred**
  - More personal and responsive care

- **Better health outcomes**
  - Delivers improved health outcomes including quality and patient experience

- **Joint provision**
  - Partnership of providers

- **Across boundaries**
  - Primary, community, secondary, mental health, social care, local government, NHS, third and private sectors

- **Systems not structures**
  - Partnerships, systems and models, not only organisations

NHS
Many Definitions of Integrated Care

- “...a coherent set of methods and models on the funding, administrative, organizational, service delivery and clinical levels designed to create connectivity, alignment and collaboration within and between the cure and care sectors...[to]...enhance quality of care and quality of life, consumer satisfaction and system efficiency for patients with complex problems cutting across multiple services, providers and settings.” (Kodner & Spreeuwenberg, 2002)

- “...a concept bringing together inputs, delivery, management and organization of services related to diagnosis, treatment, care, rehabilitation and health promotion...[as]...a means to improve the services in relation to access, quality, user satisfaction and efficiency.” (Gröne & Garcia-Barbero, 2001)
Many Definitions of Integrated Care

- “…the search to connect the healthcare system (acute, primary medical, and skilled) with other human service systems (e.g., long-term care, education, and vocational and housing services) to improve clinical outcomes (clinical, satisfaction, and efficiency).” (Leutz, 1999)

- “…the methods and type of organisation which will provide the most cost-effective preventative and caring services to those with the greatest health needs and which will ensure continuity of care and co-ordination between different services.” (Ovretveit, 1998)
1. You can integrate some of the services for all of the people or all of the services for some of the people, but you can't integrate all the services for all the people.

2. Integration costs before it pays.

3. Your integration is my fragmentation.

4. You can't integrate a square peg and a round hole.

5. The one who integrates calls the tune.

6. All integration is local.

7. Keep it simple, stupid.

8. Don't try to integrate everything.

9. Integration isn't built in a day.
Key Elements of Successful Integration

Engaging Patients
- Transparent system
- Patient Education
- Patient Responsibility

Improving Healthcare Delivery
- IT Connectivity and Support
- Continuous Improvement
- Common Guidelines
- Case Management
- Provider Networks

Aligning Finance
- Payment promotes cost effectiveness
- Performance Incentives

Motivated, Prepared Providers

Empowered Patients

Supportive Financing

Transformed, Integrated Healthcare

Improved Health Outcomes & Reduced Costs

Adapted from 2006 MacColl Institute for Healthcare Innovation
Evidence Showing Integrated Care Works

- Improved cost effectiveness shown in various integrated care studies (Hammar et. al., 2009; Olsson et. al., 2009; McRae et. Al., 2008)

- Reduced cost per patient visit to Community Health Care trusts (Hurst et. al., 2002)

- Reduced average length of hospital stay (Nickel et. al., 2010; Casale et. al., 2007; Gabow et. al., 2003)

- Reduced readmission rates (Peikes et. al., 2009)

- Decrease emergency presentations and admission in COPD and CHF patients (Bird et. al., 2010)

- Improved clinical indicators and cumulative death rates of COPD patients in China (Zhou et. al., 2010)
Singapore’s Care Integration Models & Frameworks...
Transforming the Fragmented Patient Journey...

Primary Care

Failure to detect Chronic Disease and prevent falls leads to increased complications

Intermediate/Long Term Care

Limited Community nursing services keeps patients in residential care

Patient at Home

Failure to Control Chronic Disease in the Community resulting in ED admissions

Acute Care

Poorly coordinated discharge planning resulting in ED readmission

Suboptimal usage of ILTC Services resulting in patients retained in acute care
… Into a Well Integrated Patient Journey

Primary Care

Primary Care well supported by allied health

Proactive evidence based Screening

Disease management preventing exacerbation/ complications of chronic disease

Integrated Care Pathways & care coordination enable patients to return home speedily

Upgraded ILTC providers providing care in the community

Patient at Home

National Care Assessment tool to right-site patients to ILTC Providers
Vision: Integrated Community Living - Aging in Place

Provide “Home Help” & wrapped-around services with some care supervision

1 FSC: Family Service Centre  2 NPP: Neighbourhood Police Post
Evolution of Agency for Integrated Care (AIC)

- Incorporated in August 2009

- Take on role as a National Care Integrator

- Coordinate, manage and monitor patient referrals to entire spectrum of the Intermediate and Long-Term Care (ILTC) services

- Play an active role to support the growth and development of the Primary Care and ILTC sectors
To do this, we will:-

- **Empower** clients and coordinate access to appropriate care
- **Enable** stakeholders to strengthen the primary and community care sectors
- **Enhance** collaboration to create a well-connected healthcare system
AIC IT Roadmap - AIC 2.0
AIC 2.0 - Care Integration Management

**Business Strategy**
1. Facilitate effective care transitions for appropriate care
2. Develop robust assessment framework

- For accurate assessment, right sitting, seamless transition of patients across various care settings and tracking of care plans for the patient.

- Modules includes:
  1. National Care Assessment Framework (NCAF)
     - InterRAI
     - Care Planning
  2. Integrated eReferral System
  3. Palliative Care System
     - NHG Advance Care Program
     - Project Care
  4. Subvention Management System
     - MediFund System
     - eMean Testing System
Singapore’s Solution

Care Integration through the Regional Health System (RHS) – A patient-centric healthcare ecosystem comprising of partners from the primary, acute and step down care sectors working together to deliver integrated healthcare services to improve patient outcomes.
Healthcare Reform to Achieve Integrated Care

Source: Ministry of Health, Singapore

VISION: A NETWORK OF INTEGRATED REGIONAL HEALTH SYSTEMS

RHs partnering CHs with MOU

CGH spin out to be EH Alliance in Apr 2011

“We have decided that we can achieve a better outcome if we reduce the size of each catchment and organise the healthcare delivery systems at the regional level...”

Jointly developing COPD Pathway

RH & CH pair in AHPL and JHS

“This transformation in healthcare delivery to create a hassle-free healthcare system at the regional level, is a major strategy that we are pushing. It will make healthcare more convenient, safer, better and at the lowest possible cost....” Minister for Health (Aug 2004 – May 2011)
“Singapore is now developing an electronic health records system accessible to authorised medical practitioners at our hospitals and polyclinics, and eventually extending to the community care sector. It will allow for more effective treatment of patients who may receive a spectrum of healthcare services from different providers.”

– Budget Speech 2009
National Care Assessment Framework

- **Subsidised Patients**
  - Gatekeeping for subsidised services
  - Agency for Integrated Care
  - Accreditation and audit of care assessments

- **Non-Subsidised Patients**
  - Improving patient care
  - MOH Policymakers

- **Standardised Care Needs Assessment and Referral System:** Identifying eligible patients for ILTC settings

- **Settings**:
  - Community Hospital
  - Nursing Home
  - Rehab & support services
  - Home Care
  - Palliative Care

- **Improving quality indicators**
- **Allocating resources**
- **Reimbursement policy**
- **Seamless flow of patients**
- **Improve right-siting of patients**

**Key Areas**:
- Improve patient care
- Improving right-siting of patients
- Allocating resources
- Quality indicators
- Reimbursement policy

**Additional Options**:
- Standardised Care Needs Assessment and Referral System
- Improving right-siting of patients
Overview of Chronic Disease Management Today

5 Integrated Care Pathways:

- Stroke
- Diabetes
- Acute Heart Syndrome
- Hip Fracture
- Chronic Obstructive Lung Disease

Source: Ministry of Health, Singapore
Integration Efforts involving Primary Care
Primary Care: Chronic Disease Load

Patient Load (by volume)
PRIVATE Clinics : PUBLIC Clinics
78% : 22%

Patient Load (chronic conditions)
PRIVATE Clinics : PUBLIC Clinics
57% : 43%

Acknowledgement: NHGP
A holistic approach to delivering care for chronic diseases

The Nation-wide CDMP in Singapore

- **Chronic Disease Management Programme (CDMP)**
  - Coverage & Organisation
  - Holistic care through treatment protocols
  - Improving access through innovative financing

- **Health Promotion & Disease Prevention (for NCD)**

- **Clinical quality improvement efforts in CDMP**

- **Continuum of care (Integrating care)**
  - Screening for chronic diseases
  - Right-siting care
Making Chronic Care Affordable

“Medisave” Use for Outpatient Care

- Since Oct 2006, MOH allows the use of “Medisave” for payment of outpatient care of 6 common diseases:
  - Diabetes / Hypertension / Dyslipidaemia / Stroke
  - Asthma / COPD
  - Depression / Schizophrenia

- Patients who participate in CDM programme can use Medisave to help pay medical bills at outpatient level
  - Deductible
  - Copayment
  - Annual Withdrawal Limit (S$400 from 1 Jan 2012)
  - Patient Registration and Certification
  - Use at GPs, SOCs and polyclinics
Prevention is part of every member’s care

Level 1:
70-80 per cent of a chronic care management population

Self management

Health Promotion

Level 2:
High risk patients

Care management

Level 3:
Very complex patients

Case management

High cost per case

Low cost per case

Stratification of patients according to needs

Adapted from: Kaiser
A Primary Care Approach to Integrated Care
“True North” Matrices

100%
Seamless and full integration of care processes for all our patients

100%
Complete control of chronic diseases through effective & full patient empowerment

100%
Patients have a dedicated care team led by a family physician to look after them life long

100%
Prevention of illnesses through systematic detection of health risks & effective interventions

Adding years of healthy life to the people of Singapore

Acknowledgement: NHGP
Disease Management Programmes

- Chronic Ischaemic Heart Disease
- Heart Failure
- Asthma / COPD / Pneumonia
- Stroke
- Diabetes Mellitus
- Hypertension / Hyperlipidaemia
- Depression / Early Psychosis
- Osteoporosis
- Chronic Disease Self-Management
- Prevention of Vascular Risk Factors
- Cancers
- ?HIV

Acknowledgement: NHGP
Polyclinics in Singapore

- 18 Polyclinics
- Typically sized between 12 – 25 Family Physicians and Residents; located in the “heartlands”
- 20 - 30 registered and enrolled nurses (including nurse clinicians)
- Allied health professionals, clinical laboratory and basic radiology (including mammography)
- Team-based multi-disciplinary care system
- Remote and on-site consulting with specialist physicians
- Financed through government subvention (50%) and patient revenues (50%)
- New Developments: use of technology, case management, self management by chronically ill patients, etc
Polyclinic as a Health Promotion Hub

Health Promotive and Preventive Care

• Screening (OHS, Community / Workplace Screening)

• Follow up programmes (Health Improvement Programme)

• Health Education Programme (e.g. Smoking Cessation, Stress Management and Weight Management)

• Towards a Health Promoting Polyclinic (e.g. Health Promotion Corners)

• Community Mental Health Programme

Acknowledgement: NHGP
CDM Registry

Clinical Decision Support Tool for CDM
Chronic Disease Management System (CDMS)

- Identify patients with chronic diseases
- Incorporate clinical decision support ("Alerts") for care-providers
- Deliver seamless quality care across NHG
- Outcomes tool for evidence-based population management
  - Clinical outcomes
  - Utilisation management

Acknowledgement: NHGP
HbA1c test (NHG, 2007-2009 Q2)

HbA1c Testing, Jan 07 to Jun 09

<table>
<thead>
<tr>
<th>Jan-Mar 07</th>
<th>Apr-Jun 07</th>
<th>Jul-Sep 07</th>
<th>Oct-Dec 07</th>
<th>Jan-Mar 08</th>
<th>Apr-Jun 08</th>
<th>Jul-Sep 08</th>
<th>Oct-Dec 08</th>
<th>Jan-Mar 09</th>
<th>Apr-Jun 09</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHG</td>
<td>92.56</td>
<td>92.16</td>
<td>92.46</td>
<td>92.54</td>
<td>91.97</td>
<td>92.12</td>
<td>90.41</td>
<td>90.16</td>
<td>91.44</td>
</tr>
<tr>
<td>Hospital</td>
<td>88.45</td>
<td>87.74</td>
<td>88.32</td>
<td>88.15</td>
<td>87.74</td>
<td>88.24</td>
<td>86.78</td>
<td>86.16</td>
<td>87.20</td>
</tr>
<tr>
<td>NHGP</td>
<td>97.96</td>
<td>97.69</td>
<td>97.84</td>
<td>97.72</td>
<td>97.38</td>
<td>97.27</td>
<td>95.23</td>
<td>95.27</td>
<td>96.24</td>
</tr>
</tbody>
</table>

Acknowledgement: NHG HSOR
Poor HbA1c control (NHG, 2007-2009 Q2)

Poor HbA1c Control (>9%), Jan 07 to Jun 09

<table>
<thead>
<tr>
<th></th>
<th>Jan-Mar 07</th>
<th>Apr-Jun 07</th>
<th>Jul-Sep 07</th>
<th>Oct-Dec 07</th>
<th>Jan-Mar 08</th>
<th>Apr-Jun 08</th>
<th>Jul-Sep 08</th>
<th>Oct-Dec 08</th>
<th>Jan-Mar 09</th>
<th>Apr-Jun 09</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHG</td>
<td>12.77</td>
<td>13.75</td>
<td>11.80</td>
<td>11.01</td>
<td>11.30</td>
<td>10.43</td>
<td>10.25</td>
<td>10.69</td>
<td>11.07</td>
<td>11.01</td>
</tr>
<tr>
<td>Hospital</td>
<td>17.83</td>
<td>17.02</td>
<td>16.14</td>
<td>16.12</td>
<td>17.20</td>
<td>16.23</td>
<td>16.02</td>
<td>16.86</td>
<td>18.55</td>
<td>17.03</td>
</tr>
</tbody>
</table>

*HEDIS (2005) - 23.6% - 49.1%

Acknowledgement: NHG HSOR
Proportion (%) of CDMP diabetic patients who received care components and their outcomes (2008), in comparison with UK National Diabetes Audit (2008-09) and US HEDIS Measures of Care (2009)

<table>
<thead>
<tr>
<th>Indicators (Results expressed as % Achieved)</th>
<th>Singapore (CDMP)</th>
<th>UK</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Process of Care</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 1 BP measurement</td>
<td>86.0</td>
<td>93.7</td>
<td>n/a</td>
</tr>
<tr>
<td>≥ 1 BMI measurement</td>
<td>82.6</td>
<td>88.8</td>
<td>n/a</td>
</tr>
<tr>
<td>≥ 1 HbA1c Test</td>
<td>93.1</td>
<td>91.1</td>
<td>83.2</td>
</tr>
<tr>
<td>≥ 1 LDL-c Test</td>
<td>82.0</td>
<td>89.9</td>
<td>79.5</td>
</tr>
<tr>
<td>≥ 1 Smoking Assessment</td>
<td>14.6</td>
<td>86.5</td>
<td>n/a</td>
</tr>
<tr>
<td>≥ 1 Eye Screening</td>
<td>56.8</td>
<td>68.6</td>
<td>46.9</td>
</tr>
<tr>
<td>≥ 1 Foot Screening</td>
<td>53.9</td>
<td>77.1</td>
<td>n/a</td>
</tr>
<tr>
<td>≥ 1 Nephropathy Screening</td>
<td>70.2</td>
<td>n/a</td>
<td>74.1</td>
</tr>
<tr>
<td><strong>Outcomes of Care</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HbA1c &lt; 6.5%</td>
<td>25.9</td>
<td>25.3</td>
<td>n/a</td>
</tr>
<tr>
<td>HbA1c ≤ 7.5%</td>
<td>73.8</td>
<td>63.2</td>
<td>n/a</td>
</tr>
<tr>
<td>HbA1c &lt; 9%</td>
<td>92.3</td>
<td>n/a</td>
<td>43.4</td>
</tr>
<tr>
<td>HbA1c &gt; 10% (Desired direction: LOW)</td>
<td>3.4</td>
<td>7.5</td>
<td>n/a</td>
</tr>
<tr>
<td>BP &lt; 130/80</td>
<td>55.7</td>
<td>n/a</td>
<td>28.5</td>
</tr>
<tr>
<td>BP &lt; 140/90</td>
<td>84.0</td>
<td>n/a</td>
<td>56.8</td>
</tr>
<tr>
<td>BP ≤ 135/75</td>
<td>64.9</td>
<td>28.6</td>
<td>n/a</td>
</tr>
<tr>
<td>LDL-c &lt; 5.0 mmol/L</td>
<td>99.0</td>
<td>78.1</td>
<td>n/a</td>
</tr>
<tr>
<td>LDL-c &lt; 100mg/dL</td>
<td>58.6</td>
<td>n/a</td>
<td>35.0</td>
</tr>
</tbody>
</table>
Chronic Disease Management – Diseases Where the Impact Is Very Pronounced

- Depression
- Hypertension
- Hyperlipidemia
- Coronary artery disease / heart failure
- Asthma
- COPD
- Diabetes
Some Improvement was seen in Clinical Processes and Disease Control

<table>
<thead>
<tr>
<th>Disease</th>
<th>Clinical Processes Adherence to guidelines</th>
<th>Health-Related Changes in behaviors</th>
<th>Disease Control Changes in intermediate measures</th>
<th>Clinical Outcomes</th>
<th>Healthcare Utilization Changes in utilization of services</th>
<th>Financial Outcomes</th>
<th>Patient Experience Satisfaction, quality of life, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart failure</td>
<td>Improved</td>
<td>Improved</td>
<td>Improved</td>
<td>Reduced hospital admissions</td>
<td></td>
<td>Improved</td>
<td></td>
</tr>
<tr>
<td>Coronary Artery Disease</td>
<td>Improved</td>
<td>No effect</td>
<td>Improved</td>
<td>No effect</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>Improved</td>
<td>No effect</td>
<td>Improved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td></td>
<td></td>
<td></td>
<td>No effect</td>
<td></td>
<td>No effect</td>
<td></td>
</tr>
<tr>
<td>Chronic lung disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>Improved</td>
<td>Improved</td>
<td></td>
<td>Increased utilization</td>
<td>Increased cost</td>
<td>Improved</td>
<td></td>
</tr>
</tbody>
</table>

Mattke S, Seid M, Ma S. 2007
Which interventions are more effective?

Effectiveness of disease-management programs for improving diabetes care: a meta-analysis


- Meta-analysis of RCTs
- Assess the effectiveness of disease management programs for improving glycaemic control in adults with diabetes mellitus
- Better outcome when:
  - Disease manager was able to start or modify treatment with or without prior approval from the primary care physician
    - greater improvement in HbA1C levels (standardized mean difference $-0.60$ vs. $-0.28$ in trials with no approval to do so; $p < 0.001$).
  - High frequency of contact
    - significant reduction in HbA1C levels compared with low-frequency contact programs (standardized mean difference $-0.56$ v. $-0.30$, $p = 0.03$)
Integrated Care Path for Chronic Conditions

Acknowledgement: NHGP

Preventive care
Screening and risk factor identifications
Management of at-risk population

Primary Care
Primary Care Diagnosis Flowchart
Treatment Flowchart
Patient self-management
Care needs assessment & training
Continuing Care Risk factor management
Management and prevention Of Complications
Continuation of rehabilitation

Acute Care
Management of acute event
Rehabilitation plan
Multidisciplinary team assessment
Discharge planning

Palliative Care
Needs assessment
Management of emergencies and symptoms (including psychological)
Review medical care'
Manage terminal phase

Community Hospital

NATIONAL STANDARDS of CARE
Resource Management and Measurements

Proposed Framework for ICP

Referral guidelines and template
At risk’ population (40 yrs & above)

Offer Opportunistic Health Screening (OHS) for detection of diabetes, hypertension and lipid disorders (height/weight, blood pressure, finger prick blood test for cholesterol & blood sugar levels)

If chronic diseases are detected

Doctor assessment for other cardiovascular risk factors and complications

According to patients’ needs, counselling will be given by care managers and allied health professionals on weight, dietary and health education

Regular follow-up visits to monitor progress and for medication prescription

Annual tests (blood, urine, ECG) to detect other cardiovascular risk factors and complications
## Future State: Acute and Chronic Care

<table>
<thead>
<tr>
<th>Acute Chronic</th>
<th>Pre Consult</th>
<th>Consult</th>
<th>Post Consult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Clinician</td>
<td>Nurses/Allied Health</td>
<td>Nurses</td>
<td>Doctors</td>
</tr>
<tr>
<td>Non Clinician</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) Aim to right site 100% to non-doctor for Pre & Post Consult Workflows
2) Doctors freed up to be deployed to strategic areas, e.g. teaching, research, complex chronic

### Acute

**Minor Ailment Clinic; nurse clinicians and pharmacists seeing patient consultations for URTI cases,**

- **25% of total acute attendances by non-doctors**

### Chronic

**Simple chronic cases consultations substitution by non-doctors,**

- **24% of total chronic attendances siphoned to non-doctors**
Team Care: Our Key Focus

Care for our **Chronic Patients**
- Design and re-design care paths with patient safety in mind and correct referrals to hospitals

Care for our **Acute Patients**
- Leveling of workload without compromising safety

Care for our **Children**
- Developmental assessment
Team Care: Utilising non-doctor Clinicians

1 Singaporean to 1 Family Physician Led Team

Case complexity

Complex Chronic

Simple Chronic

- Family Physician Clinic
- Advanced Practice Nurse Clinic
- Care Manager Clinic
- Care Coordinator Clinic
- General Clinic
- Second Tier Clinic
- Family Physician Clinic

Patients

Good control
Nurses > Drs

Poor control
Drs > Nurses

Acknowledgement: NHGP
DEFINING TEAM ROLES:
Main Coordinators

- SECOND TIER CLINIC
- GENERAL CLINIC (DR-LED)
- ADVANCED PRACTICE NURSE CLINIC
- CARE MANAGER CLINIC
- „PANEL’ CLINIC
- PHARM / CLINICAL PHARMACIST (HDL / ACC)
- DIETITIAN
- CARE AND COUNSELLING

Acknowledgement: NHGP
<table>
<thead>
<tr>
<th>CARE DELIVERY MODEL – PATIENT MIX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acknowledgement: NHGP</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>“Complex Care Clinic”s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medically complex, complex needs</td>
</tr>
<tr>
<td>Poor control</td>
</tr>
<tr>
<td>Step-down care (CVA, osteoporosis, HF)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Team-based clinics (Dr-led)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General clinic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APN Clinics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable chronics with TOD*</td>
</tr>
<tr>
<td>Unstable Diabetes, Hypertension, Lipids (co-managed with Dr)</td>
</tr>
<tr>
<td>Niche areas of interest **</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Care Management Clinics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable DHL without TOD*</td>
</tr>
<tr>
<td>Co-manage specific subsets with special educational / care needs e.g. hypoglycemia</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>“Panel Clinic”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable single or dual DHL without TOD*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical Pharmacist / Pharmacist Clinics</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC stable and unstable</td>
</tr>
<tr>
<td>DHL clinics with focus on drug optimization e.g. insulin titration, polypharmacy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dietician Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newly diagnosed DHL</td>
</tr>
<tr>
<td>Poorly controlled DHL</td>
</tr>
<tr>
<td>Overweight</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Care and Counselling Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex patient needs, including behavioral issues</td>
</tr>
<tr>
<td>Care arrangement, Home visits</td>
</tr>
<tr>
<td>Links to community resources</td>
</tr>
</tbody>
</table>
Evolving role of Pharmacists in Primary Care
Pharmacist-run Clinical Services: Diabetes Mellitus Clinic

- A clinical service already in existence in different parts of the world
  - Mainly in the USA
  - Also found in Australia, Canada, Hong Kong, and Spain

- Positive effects of pharmacist outpatient interventions on adults with DM: A Systematic Review

Acknowledgement: NHGP
Pharmacist Clinical Activities: Drug Optimization

Closser monitoring
Aherence problem
Resistance to drug therapy
Empowerment in patients’ own drug therapy
Polypharmacy
Insulin titration
Lack in drug-related knowledge
Lack in drug administering techniques
Switching of drugs

Care Pills

Acknowledgement: NHGP
TRANSFORMING PRIMARY CARE
TRANSFORMING PRIMARY CARE

What we want to achieve

Increased access options to primary care

- Increase delivery options & Infra development of polyclinics:
  - Family Medicine Clinics (FMC)
  - Medical Centres (MC)
  - Private GP Clinics supported by Community Health Centres (CHC)

Increased affordability of care in the community

- Enhance financing schemes:
  - Increase Medisave limit for CDMP
  - Portable subsidy through expansion of PCPS

Seamless integrated care continuum

- Integrate primary care services into RHS:
  - Develop RHS-GP network
  - GP engagement

Improved quality of care through increasing medical expertise

- From Doctor-centric to Team based care:
  - FMCs, MCs, CHCs
  - Expand the role of primary care physicians (FPs)
- Raise standards of FM practice:
  - FM residency
  - FP register

Enablers

- Manpower
- IT
- Performance Measurement

Acknowledgement: Ministry of Health, Singapore
Family Medicine Clinic – Model of care

**Services**
- Focus on chronic disease treatment, but with acute illness treatment as well to provide holistic care
- Future FMCs will have the services provided by a polyclinic, e.g. vaccinations
- Potentially Urgent Care clinics

**Appointments**
- Appointment based system for chronic diseases to improve efficiency and reduce waiting times
- Walk-in patients will still be treated

**Team based care**
- Care provided by a team including doctor, nurses, APNs, pharmacists and AHPs

Acknowledgement: Ministry of Health, Singapore
Medical Centre - Model of care

Provide care between FMC and SOC level

- Focused on decanting patients from SOC, reducing unnecessary visitations, rather than replicating a satellite SOC in the community

Has an FMC base

- Provide chronic disease management and other primary care services to cater to the needs of the community

Staffed by FPs and FP+

- FPs and FPs with special interests in selected specialties will provide services, keeping costs down to the system and patient while providing quality care

Acknowledgement: Ministry of Health, Singapore
TRANSFORMING PRIMARY CARE
How it relates to the RHS

Cluster of GPs supported by CHC

CDMP GPs
Chronic and mental health
CDMP GPs
Medisave IT Linkages

PCPS GPs
Chronic and mental health
PCPS GPs
Portable subsidies

Regional Hospital
Inpatient Care
Specialty Centres
Selected Outpatient Care

Medical Centre
Revised model for chronic care
Day Surgery + Selected Specialist Care

Family Medicine Clinics
Revised model for acute care
Revised model for chronic care
Shared X-ray and Lab service
Team-based care model
Urgent Care Services*

Care model in polyclinics will progressively transform to that of FMCs

Polyclinics
Revised model for acute care
X-Ray Laboratories
Revised model for chronic care
Doctor-centric care model

Acknowledgement: Ministry of Health, Singapore
Transitional Care
About Transitional Care

- Transitional care can be defined as care that is required to facilitate a shift from one disease stage and/or place of care to another.

- Transitional care is based on a comprehensive plan of care and the availability of health care practitioners who are well-trained in chronic care and have current information about the patient's goals, preferences, and clinical status. It includes logistical arrangements, education of the patient and family, and coordination among the health professionals involved in the transition. Transitional care, which encompasses both the sending and the receiving aspects of the transfer, is essential for persons with complex care needs.

ACTION Teams

- Aged Care Transition (ACTION) Teams

  - Assess the needs of elderly patients and facilitate their transition into appropriate care upon hospital discharge
  - 65 care coordinators in 5 RHs, 1 Tertiary Centre & 3 Community Hospitals
  - More than 10,000 patients recruited since 2008
  - Average length of stay (bed days) reduced by 43% and 82% of cases were able to discharge
The Need for ACTION Teams - Why

Repeated hospital admissions due to lack for appropriate care.

Disorganised medications and from multiple sources, often leading to double dosing

Living environment in disarray, compounding to health conditions
About Post Acute Care at Home (PACH) 
Tan Tock Seng Hospital

- PACH is a clinical management model targeted at the management of patients requiring higher acuity of care

- Target population:
  - Home bound with complex chronic diseases or exacerbation of diseases
  - Eg- Frail or elderly with mild to moderate infections, patients requiring short term intravenous/ intravascular antibiotics, patients with exacerbations of chronic conditions (COLD, heart failure)

- Project Objectives:
  - Reduce readmissions/ ED re-attendences for the target population
  - Support providers of community nurse service in handling more acute patients in the home
Plugging the gaps in the ILTC sector
Current Gaps in ILTC Services

Long-term care today: fragmented / poorly-funded services

Many gaps resulting in
- Frequent hospital admissions / re-admissions
- Delayed discharge from hospitals
- Premature institutionalisation (to NH)
- Deteriorating health of the elders
- Caregiver stress

Diagram showing different levels of care:
- Frail
- Very Frail
- Dying
- Caregiver at home (Family / Maid)
- No caregiver at home

Services include:
- Home Hospice
- Inpatient Hospice
- Nursing Homes
- Home help
- Community care mgmt
- Home Medical / Nursing
- Day rehab and day care

---

Current Gaps in ILTC Services

Many gaps resulting in
- Frequent hospital admissions / re-admissions
- Delayed discharge from hospitals
- Premature institutionalisation (to NH)
- Deteriorating health of the elders
- Caregiver stress

Diagram showing different levels of care:
- Frail
- Very Frail
- Dying
- Caregiver at home (Family / Maid)
- No caregiver at home

Services include:
- Home Hospice
- Inpatient Hospice
- Nursing Homes
- Home help
- Community care mgmt
- Home Medical / Nursing
- Day rehab and day care

---

Current Gaps in ILTC Services

Many gaps resulting in
- Frequent hospital admissions / re-admissions
- Delayed discharge from hospitals
- Premature institutionalisation (to NH)
- Deteriorating health of the elders
- Caregiver stress

Diagram showing different levels of care:
- Frail
- Very Frail
- Dying
- Caregiver at home (Family / Maid)
- No caregiver at home

Services include:
- Home Hospice
- Inpatient Hospice
- Nursing Homes
- Home help
- Community care mgmt
- Home Medical / Nursing
- Day rehab and day care
Need For New Services – Plugging the Gaps in ILTC

- Integrated home and community care
- Integrated home hospice care
- Respite care
- End-of-life care in NHs
- Fall prevention / home fittings
- Hospice day care

Caregiver at home (Family / Maid)

- Home help
- Day rehab and day care
- Home Care
- Integrated Home and Community Care

No caregiver at home

- Nursing Homes
- End-of-life Care in Nursing Homes
- Inpatient Hospice
- Hospice Day Care
- Integrated Home Hospice

Frail

Very Frail

Dying
Program of All Inclusive Care for the Elderly (PACE) in the US

Started in the 70s in San Francisco, USA

Objectives of PACE are to:
- Delay institutionalisation and reduce utilisation of acute healthcare services
- Enables frail elderly to receive the care that they need in the community that they are accustomed to

Delivering all needed medical and supportive services, (via capitated funding model) the program is able to provide the entire continuum of care and services to seniors with chronic care needs, while maintaining their independence in the community for as long as possible.

Interdisciplinary team based approach to caring for the participant

Clearly shown that in a debilitated, frail, elderly population, with whom health care costs are expected to be high, a combination of team care, managed health care and care coordination can lead to better outcomes and reduced cost over time (Hirth et al, 2009)
Singapore Programme for Integrated Care for the Elderly (SPICE)

- Officially launched in 26 Oct 2010
- Salvation Army - Bedok Multi-Service Centre
- Offers an alternative to nursing home for patients discharged from acute hospitals
- Fulfills care needs of frail elderly in the community
- BASED ON THE PROGRAM OF ALL INCLUSIVE CARE FOR THE ELDERLY (PACE) IN THE US
• Individualized Care Plan
• Multi-disciplinary Team
• Social / Community activities
• Prevention / Active Ageing activities

• Personal Care
• Medical and Nursing care
• Rehabilitation
• Day Care Services

*MSW & Doctor: Not under staffing from SPICE
Contact Center

- Consolidated Health and Social helpline for all inquiries pertaining to elderly issues

- Call center will be equipped with the following systems to support operations:
  - AIC/CEL E-Referral System
    - System that contains all referral information
  - Customer Relationship Management System
    - Database of the customer’s information
  - Knowledge Management System
    - Embedded call script to support the call center function
  - Helpline
    - Collection of services available in the RHs and direct link to the RHs call center

- Call center has tele-health / tele-care monitoring capabilities for elderly patients living at home
ROLE OF THE PHARMACIST IN THE ILTC SECTOR

Community Pharmacists

- Primary Care
- Polyclinics
- Screening & Prevention
- GP/Family Physicians
- Regional Hospitals

Hospital Pharmacists

- Acute to Intermediate-Term Care
- Community Hospitals
- Nursing Homes
- Rehab & Home Care

Long-Term Care - End of Life Care

- Palliative Care

Patient

[Diagram showing the flow between different healthcare sectors and the role of the pharmacist]
Challenges in the ILTC Sector

- Lack of awareness on patient safety
- Lack of incentives to improve
- Lack of emphasis on pharmacy care
Enhancing the Role of the Pharmacist in the ILTC sector

- Contribute to care integration by addressing the transition-related medication problems for the elderly
- Build capabilities of service providers
- Safer Care
- Enhance relationship between healthcare professionals in the ILTC sector
Pharmaceutical Care Programme

Aims to improve the safety and quality of patient care by providing medication “check-up” for residents in nursing homes. Includes:

- Medication review/reconciliation for residents in the nursing home
- Improve medication use and safety
- Drawing up policies, procedures and SOPs with the NHs
- Training and support of nursing care staff
Innovative Pilot Projects between Acute Hospitals and Community Partners
Innovative Use of IT In Care Delivery for care
Khoo Teck Puat Hospital

- Regional Nursing Home Hub through Telemedicine (“Virtual Ward”)
- Geriatricians from the hospital conduct consults using webcams with various nursing home partners to review patients
Changi General Hospital: Disease Management Unit (Diabetes)

1. Identify
- ICD9 Codes
- Mental health cases and high morbidity, bed-bound

2. Stratify
- HbA1c
  - 4-7 = Well
  - ≥7.91 = Sub-optimal
  - ≥8.1 = Poor
- Topics:
  - HbA1c, diabetic meds
  - Blood glucose monitoring
  - Hypertension, meds
  - Early identification of red alerts
  - Hyperlipidaemia, meds
  - Lifestyle (dietary, exercise)
  - Extra: fasting & diabetes
  - Sick day rules

3. Programme Modules
- Topics:
  - HbA1c, Lipids, Cholesterol
  - Clinical Indicators: BP, BMI
  - Readmission
  - A&E Visits
  - Default annual checks

4. Evaluation
- Tele-education
- Tele-monitoring
- Tele-case management
- Tele-referral
- Tele support
- Patient safety program
- Carer’s support
- Social support referral

5. Passive Monitor
- HbA1c, Lipids, Cholesterol
- Clinical Indicators: BP, BMI
- Readmission
- A&E Visits
- Default annual checks

6. Review
- E-mortality rounds
- E-morbidity rounds

7. Fine-tune

Courtesy of Changi General Hospital
Overseas Models
Geisinger Health System (Pennsylvania, US)

- Serves mainly rural population – poorer, older, sicker population (~2.6 million)

- Pay for performance vs fee for service

- 1995 – adopted and deployed system-wide electronic health records (EHR)

- Key innovations: LIFE Geisinger (PACE) and The Advanced Medical Home
US Medical Home

- The concept was first introduced in 1967 by the American Academy of Pediatrics (AAP).
- Further developed by the American College of Family Physicians (ACP) and American Academy of Family Physicians (AAFP) to an enhanced model referred to as “Advance Medical homes (AMH)”.

[Diagram showing the concept of US Medical Home with elements such as Specialist, Case Managers, Allied care professionals, Self-care education, Personalized Care, Vertical integration of care, and Care coordination.]
US Medical Home

1. Broad spectrum of coordinated patient care (acute to complex chronic conditions)
2. Provide accessible, continuous and integrated care
3. Fee-for-service payments and care coordination
4. Patient-centered care, guided by family personal physicians-patient relationships
5. A primary care physician plays a gate-keeping role and work with a team of allied healthcare professionals and case managers
6. If the patient requires specialized care, the family physician continues to work with the specialist in areas where necessary and design the best coordinated care treatment for the patient.
About Jonkoping (Sweden)

Health Care in Jönköping County

- 11 municipalities
- 330,000 inhabitants
- 3 hospitals
- 34 primary care centers
- 35 Dental care centers
- 9,800 employees
- Regional development support

Source: Jonkoping
Jonkoping – Factors Contributing to Healthcare Standards

A history of Quality as Business Strategy in the County Council of Jönköping, Sweden

- **Education**
  - Common Values & Improvement tools (Educ. for many)
  - Process Leader Education

- **Awareness**
  - Patient Need Related Groups
  - Main processes defined
  - Accreditations of laboratories

- **Redesign**
  - Balanced scorecard
  - Qulturum established
  - Access/Collaboratives
  - Quality Award to Occupational therapists
  - The Child Dialogue
  - IT = improvement engine
  - Medication Dialogue

- **Process thinking**
  - Esther – seamless care for elderly
  - Special programmes for physicians
  - Healthcare Process Redesign

- **Movement**
  - Big Group Healthcare
  - The Diamond picture
  - System thinking
  - Quantum Leaps in Patient Safety

- **Full scale**
  - Pursuing Perfection
  - Swedish Malcolm Baldridge Award to Internal Medicine, Eksjö and special gratuity to Ryhov County Hospital
  - Medication collaboratives
    - System measurements
    - Microsystems
    - Bridging the Gap

- **Environment work becomes a part of Business strategy**
  - Clinical Improvements - new approach
  - ATP – Brent James


- **Swedish Malcolm Baldrige Award (QUL): Hospitals (Värnamo, Ryhov) and clinics**
  - write QUL

- **Total Quality Management**
  - Organization Evaluation, (in Swe: QM)
  - A new type of Development Dialogue = Annual report

- **Audit Group for Medical Evaluation**
  - Leadership development that stress dialogue

Source: Jonkoping
Challenges & Moving Forward
Challenges in Care Integration

- The different “fragments” in the healthcare industry, including the different departments in an organisation, are usually working in “silos”.

- An uphill task to convince the different fragmented bodies to change their “old” working style to work and collaborate together in an integrated eco-system.

- Many are still more concerned over the short-term benefits such as their “bottomline”, than the long-term benefits which care Integration heralds, especially when more effort and monetary investments are required from them.
In Summary (“The Mighty 8”)

- Healthcare is complex and fragmented, and hence a multitude of solutions and approaches are required to tackle the growing challenge of chronic diseases and the ageing population.
- A recurring key piece of the solution is **collaborations** and fostering long term **partnerships** between providers and patients.
- Technology is an enabler and will factor more and more in time to come. No “magic bullet” technological solution.
- Best financing model is one which fosters personal responsibility and ownership of care by patients.
- Develop a mindset of innovation and continuous improvement.
- The “new age” healthcare professional must understand how to leverage on technology and interpret relevant data.
- Primary care, secondary care and tertiary care all need to be linked and integrated by pathways and through technology.
- Prevention is better than cure!
Thank you

Email: Jason.Cheah@aic.sg

Please visit us!
www.aic.sg
List of Bibliography (1)


Glen D Steele et al (2010); How Geisinger’s Advanced Medical Home Model Argues the Case for Rapid-Cycle Innovation. Health Aff November 2010 vol. 29 no. 11 2047-2053
