Integrated Practice Units (IPUs) Enhance Clinical Research

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Association of Academic Health Centers (AAHC)
2017 Global Issues Forum
AGENDA

01 Healthcare Landscape

02 Importance and Need for IPUs

03 How IPUs Enhance Research

04 Concluding Remarks
Public Healthcare Delivery Network
Public Healthcare Delivery Network (Cont’d)

ACADEMIC MEDICINE

Healthcare Landscape

SingHealth
Sengkang General Hospital

Changi General Hospital

Ng Teng Fong Hospital
Jurong Community Hospital

NUHS
National University Polyclinics

National University Cancer Institute, Singapore
National University Heart Centre, Singapore

ACADEMIC MEDICINE CENTRES
Continuing Challenges in the Healthcare Landscape

1. Growing Population
2. Rapid Ageing Population
3. Longer Life Expectancy
4. Manpower Crunch
5. Burden of Chronic Diseases
6. Increasing Healthcare Costs
7. Rising Patient Expectations

Source: Department of Statistics Singapore; Ministry of Health Singapore
Overview of SingHealth Group
Our Full Continuum of Care

Every year...

215,698
Inpatient Admissions

1.1 Million
Patient Days

153,104
Day Surgeries

99,006
Inpatient Surgeries

1.88 Million
Polyclinic Visits in 9 Locations

2.36 Million
Specialist Outpatient Clinic Visits

Primary Care

Secondary, Tertiary, Quaternary Care

Continuing Care

Data source: E-stats (based on Jan to Dec 2016, including CGH)
Our Shared Vision & Mission

**Vision**
Defining Tomorrow’s Medicine

**Mission**
Care to Heal. Educate to Empower. Innovate to Advance.
Major Health Services Provider in Singapore

4,928,671 SOC Attendances

SingHealth 40%

CGH, 9%

517,925 Inpatient & Day Surgeries

SingHealth 40%

CGH, 11%

Data source: E-stats (based on Jan to Dec 2016)
New Models of Care

National Role
Cutting Edge Tertiary & Quaternary Care

Regional Role
Community & Population Health
Building Care Continuum Capabilities

Our Patients

Case Management | Operations | HR | Finance | IT | Education and Research Infrastructure

Undergirding Enablers

One SingHealth Regional Health System (RHS), Multi Operating Sites [CGH, KKH, SGH and SKGH Campuses]

Community / Primary
- NHGP
- NUP
- GP
- Chinatown FMC, Tiong Bahru CHC
- SHP Primary Care

Acute / Secondary
- SKGH Campus
- CGH Campus
- KKH Campus

Tertiary / Quaternary
- SGH Campus
- Campus DEM
- Campus Inpatient
- Campus ASC

Intermediate / Long Term
- Bright Vision Hospital
- Outram Community Hospital
- Sengkang Community Hospital
- St. Andrew’s Community Hospital

One SingHealth Regional Health System (RHS), Multi Operating Sites [CGH, KKH, SGH and SKGH Campuses]

Undergirding Enablers
- Case Management
- Operations
- HR
- Finance
- IT
- Education and Research Infrastructure

SingHealth DukeNUS Academic Medical Centre

Academic Medicine. Improving Patients’ Lives
Challenges – “Fragmented” Care

- Patients with co-morbidities are treated for each condition in isolation
- Patients need to maneuver a complexity of services, appointments, physicians and locations
- Duplication of databases and research
Desired State
– Leading Change at the Patient Level

• Patients with co-morbidities are treated holistically

• Seamless care that is well-coordinated

• Disease databases with well-characterised phenotypes

• Research through the continuum of care
## Essence of an Integrated Practice Unit (IPU)

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<thead>
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<tbody>
<tr>
<td>1</td>
<td>Organised around medical condition</td>
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<tr>
<td>2</td>
<td>Multidisciplinary team</td>
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<td>3</td>
<td>Common organisational unit</td>
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<td>4</td>
<td>Full cycle of care</td>
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<td>5</td>
<td>Patient education, engagement, follow-up</td>
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<td>6</td>
<td>Single administration structure</td>
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<td>7</td>
<td>Co-location of care</td>
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<td>8</td>
<td>One physician team leader</td>
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<td>9</td>
<td>Measure outcomes, costs and processes</td>
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<td>10</td>
<td>Joint accountability</td>
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SingHealth Duke-NUS Disease Centre (SDDC) is an IPU with Cluster wide practice sites.

Providing oversight of care for patients with conditions that especially benefit from multidisciplinary coordination for training, research and clinical service.
Traditional Model of Care

Suspicious Mass

- SHP
- NCCS
- KKH
- SGH
- NDC
- NHCS
- NNI
- SNEC
- SKH

- Pre-op Test
- PET Scan
- Surgery
- DXT Chemo
- SOC
New Model of Care

SingHealth

Facilitate patient access

Facilitate cross specialty collaboration

Improve access to facilities

Cardiac Tests
Neuro Tests
Eye Tests

O&G
CT
Dental

DXT
Paed Tests
MRI
PET
Rx
PCI
CABG
CT
MRI

Importance and need for IPUs
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04 Concluding Remarks
SingHealth Duke-NUS Breast Centre

1,200 NEW Breast Cancer cases seen at SingHealth institutions

67% of NEW cases in Singapore

National Cancer Centre Singapore
SingHealth
400

Singapore General Hospital
SingHealth
300

KK Women’s and Children’s Hospital
SingHealth
300

Changi General Hospital
SingHealth
150

Sengkang Health
SingHealth
50

Multi-Site Practice

How IPUS enhance research

Academic Medicine. Improving Patients’ Lives
Healthcare Workers Involved in SD Breast Cancer

- Radiology Oncologists
- Physiotherapists
- Breast Care Nurses
- Palliative Care Physicians
- Medical Social Workers
- Medical Oncologists
- Pathologists
- Surgeons
- Psychologists
Joint Breast Cancer Registry (JBCR)

- Contributed by various healthcare workers from all sites of practice and data from Breast Tumor Board
- Crucial for audit and large scale studies
- Enable team to perform in-depth analysis of cancers in small but significant sub-populations, e.g. pregnancy associated breast cancer (PABC)
Perioperative Outcomes of Therapeutic Breast Surgery in the Elderly

Female Singaporeans currently have a 1 in 23 lifetime risk of breast cancer. It is estimated that by the age of 85 years, 1 in 3 women will develop breast cancer. There is a potential 1500 cases of breast cancer among octogenarians each year. Surgery is curative in early breast cancer, and centres have reported no difference in survival rates of the elderly age group and younger counterparts. However, surgery is associated with increasing morbidity and mortality. Despite its therapeutic role, elderly women are often not discussed about surgery options with their doctors.

We wanted to objectively report the postoperative outcomes and morbidity of elderly patients undergoing surgery in our institution. We also hoped to identify factors that may predict for a poorer outcome. This is the first study in an Asian population to look at postoperative survival rates for elderly postoperative surgery patients.

Materials and Methods

Patients diagnosed with breast cancer and undergoing surgery at the National Cancer Centre Singapore General Hospital (SGH), July and December 2010 were identified.

Functional status was measured in the form of American Society of Anesthesiologists (ASA) physical classification status and Eastern Cooperative Oncology Group (ECOG) score. Outcomes were measured in the form of perioperative morbidity and mortality, length of hospital stay, and incidence of postoperative complications.

Results

A total of 109 females with a mean age of 83.2 years...
SingHealth Duke-NUS Diabetes Centre

One Integrated System for Diabetes Care

1. Provide oversight of care delivery & outcomes
   - KK Women and Children’s Hospital
     - Obstetrician
     - Pediatric Endocrinologist
   - National Heart Centre
     - Cardiologist
     - Cardiothoracic surgeon

2. Streamline Care Processes
   - Diabetes and Metabolism Centre
     - Endocrinologist
     - Nephrologist
     - Vascular Surgeon
     - Ophthalmologist
     - Dentist
     - Nurse Educator
     - Dietitian
     - Podiatrist
     - Social Worker
     - Psychologist
     - Facilities
       - Outpatient clinic
       - Laboratory
       - Pharmacy
     - Dental clinic
     - Radiology
     - Peritoneal dialysis
   - National Neuroscience Institute
     - Neurologist
   - National Dental Centre
     - Periodontal surgeon

3. Set standards of care training & education
   - Sengkang General Hospital
     - Endocrinologist
   - Changi General Hospital
     - Endocrinologist

4. Pool data for audit, QI & research
Streamlining for Specific Conditions

Specialists from different disciplines or institutions collaborating to streamline care for specific conditions

- Pre-Diabetic
- Endocrinology
- Vascular Surgery
- Primary Care
- Renal Physician
- Ophtalmology

Screening, Diagnosis, Treatment, Outcomes

• Overview of care delivery for a specific condition
• Access
• Time to Dx
• Treatment
• Quality
• Outcomes
• Cost
SingHealth Diabetes Action Taskforce (SDAT)

5-YEAR STRATEGY

**STOP Diabetes**

- **WELL**
- **WELL AT RISK**
- **PRE-DM**
- **DM – NO COMPLICATIONS**
- **DM - COMPLICATIONS**
- **END OF LIFE**

**PUBLIC EDUCATION**

- General Health Promotion
- Awareness Programmes (Health, Lifestyle Modifications)
- Community Education
- Forum

**SCREENING & DETECTION AND BETTER DISEASE MANAGEMENT FOR GDM**

- OGTT Testing among all Pregnant Women (Pre- and Post-natal)
- Annual Screening Programme for Women & Their Babies who had GDM during Pregnancy; Follow-ups

**BETTER DISEASE MANAGEMENT**

- Start Right Programme (Diabetes Curriculum)
- Development of DM App (HPB)
- Walking Away from Diabetes (pre-DICTED Programme)
- STOP Diabetes health Screening
- Community Screening
- SingHealth Workplace Screening
- Screen all Patients with Hypertension and Hyperlipidemia for DM

**EARLY SCREENING & DETECTION**

**ONE STETHOSCOPE / INTEGRATED IT SYSTEM**

**DIABETES DATA REGISTRY**

**FINANCE**

**VISION**

To create a supportive environment for Singaporeans to lead lives free from diabetes and for Singaporeans with diabetes to manage their diabetic condition well.
D I A B E T E S  S C R E E N I N G

1st Fasting Blood Glucose (FBG)
At Risk | Abnormal

STOPDiabetes
Targeted Health Screening
9%

Community Health Screening
Mass Health Screening
10%

STOPDiabetes
30-40 yo with
At Risk or Abnormal screening results

BMI
69%

Blood Pressure
13%

High % from 30-40 yo age group picked up with DM risk factors
GESTATIONAL DIABETES MELLITUS (GDM) DISEASE MANAGEMENT

Routine Screening of GDM with OGTT# at 24 to 28 weeks for all pregnant women

Early detection and intervention of GDM can help to reduce 40% of complications

15% Average GDM Rate*

Of the 15% patients with GDM, ~67% will develop Type II Diabetes in their lifetime

* Using International Association of the Diabetes and Pregnancy Study Groups Criteria

OTHER GDM INITIATIVES
- Community Outreach® and Education Programs to raise awareness, targeted at women and families
- Develop Care Model for Post Natal GDM Care

@ In partnership with MOH, PA and HPB
SingHealth Diabetes Registry

- Pools data from SingHealth Institutions
- >100K unique patients with Diabetes
- Dashboard for real-time monitoring of clinical outcomes
- Supports population health initiatives
- Facilitates registry-based research

Source System

Database (Electronic Health Intelligence System eHiNTS)
SingHealth Diabetes Registry

- Enables patient stratification and audit of care
- Patient journey can be monitored
- Better outcome management
- Comprehensive and evidence-based disease management
- Robust platform for clinical research

Diabetes Registry Dashboard
Centre of Excellence within SD Diabetes Centre

SingHealth and Medtronic Establish Centre of Excellence for Diabetes Care

To advance treatment, care management and research in South East Asia

**THE STRAITS TIMES**
Singapore pairs up with foreign medical tech giant in fight against diabetes

**EDB**
Medtronic Strengthens Commitment to Asia Pacific with Regional Headquarters and Establishment of Diabetes Centre of Excellence

**NIKKEI ASIAN REVIEW**
May 31, 2016 8:00 pm JST
Medtronic partners with SingHealth to fight diabetes
JUSTINA LEE, Nikkei staff writer
SD Diabetes Centre – NMRC New Investigator’s Grant

Bridging the gap between Medical and Dental professionals through SDDC

Diabetes & Metabolism Centre

National Dental Centre Singapore

Oral Complications of DM

- Periodontal Disease
- Oral Mucosal Diseases
- Candidiasis
- Xerostomia
- Dental Caries
Efforts to begin battle against diabetes in the womb

Singapore has one of the highest incidences of gestational diabetes mellitus (GDM) in the world, with 8 per cent to 12 per cent of pregnancies being complicated by GDM. GDM, or diabetes in pregnancy, can lead to long-term health problems and affects the health of both the mother and her baby.

Recently, the Singapore Diabetes Centre – a collaborative effort between the KK Women’s and Children’s Hospital, Duke-NUS Medical School, and Singapore General Hospital – launched a new initiative to combat diabetes in pregnancy. The programme aims to improve the detection and treatment of GDM, and reduce the long-term health risks for both the mother and the baby.

In the past four months, the take-up rate for GDM testing has increased, with 40 per cent of pregnant women now undergoing the test. The Centre will also conduct follow-up studies to monitor the health of the mothers and babies after delivery.

The Centre is also working with the Ministry of Health to develop a new screening tool for GDM, which can detect the condition early and enable timely interventions.

The Centre is currently conducting a pilot study involving 50 pregnant women. The study aims to evaluate the effectiveness of the new screening tool and the impact of early intervention on maternal and fetal outcomes.

KK Women’s and Children’s Hospital
Duke-NUS Medical School
Singapore General Hospital
**TargEted TheRApy for Blood Cancer (TETRAD)**

*35% INCREASE in blood cancer cases over the past decade*

Mortality rates for blood cancer relatively unchanged*

**CHALLENGES**

1. Complex omic landscape
2. Patient heterogeneity
3. Need better understanding of Asian profile
4. Conventional clinical trial design not ideal
5. Drug resistance to targeted therapy
6. Need more robust preclinical model

* Singapore Cancer Registry Report No. 8 (2015)
TETRAD – A Cross Institutional Collaboration

4 Public Healthcare Institutions
37 Haemato-oncologists
5 Clinician Scientists
> 80% Nation’s Blood Cancer Patients

2 Academic Institutions

157 Clinical Trials (450 patients)
245 Publications
$27 Million Grants
2500 Repository Samples

2012 to 2015

Strategy

1. National platform for targeted therapy for blood cancer
2. Build capacity and core infrastructure
3. Pipeline for talent development
4. Academic hub for research and training
5. Early phase clinical trials
A National Platform for Novel Targeted Therapy for Blood Cancer

Theme 1: Novel Target & Biomarker Identification
1. Profile human tissue and PDX models
2. Identify novel targets and biomarkers
3. Determine mechanisms of resistance

Theme 2: Molecular Targeted Therapy
1. Establish PDX models
2. Preclinical therapeutic screening
3. In vivo molecular imaging

Theme 3: Cellular Immunotherapy
4. Biobanking

Theme 4: Antibody Based Therapy

Theme 5: Overcoming Drug Resistance

How IPUS enhance research
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Benefits of Integrated Practice Units

1. Fellowship programmes
2. Collaborative research
3. Robust clinical databases
4. Consistent and seamless care through harmonised protocols and care pathways
Thank you