The Impact of Smart IT System on Provider Decision Making in Aged Population

TAIWAN, Changhua Christian Hospital
Center for Geriatrics and Gerontology
Dr. Chun-Hsiung HUANG
2016-6-9
Changhua population: 1.3 million, 13.64% ≥ 65 y/o
Taiwan, 12.51% in 2015

Medical Center
Over 60 specialties
4416 employees
1713 in-patient beds
5380 patient visits daily
26.61% ≥ 65 y/o
Update: 2016-3
Efficiently Identify Risk, Effectively Implement Prevention!

Paper work
- Incident event reporting
- Sampling Medical record
- Identify risk
- Develop screen tool
- Implement prevention

Hospital intranet
- Hospital Information System
- Electronic Medical record
- Identify risk easily
- Develop Screen tool fast
- Implement Prevention completely

Cloud System
- Closed Loop, Interactive
- Efficiently identify risk
- Effectively develop screen tool
- Comprehensively Implement prevention
Data of Sentinel Events

Changhua Christian Hospital
1. Medication error
2. Fall

<table>
<thead>
<tr>
<th>Rank</th>
<th>Type of Sentinel Event</th>
<th>2004-2015 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wrong–patient, wrong-site, wrong-procedure</td>
<td>1215</td>
</tr>
<tr>
<td>2</td>
<td>Delay In Treatment</td>
<td>1052</td>
</tr>
<tr>
<td>3</td>
<td>Unintended Retention of a Foreign Body*</td>
<td>1103</td>
</tr>
<tr>
<td>4</td>
<td>Suicide</td>
<td>952</td>
</tr>
<tr>
<td>5</td>
<td>OP/post-op complication</td>
<td>924</td>
</tr>
<tr>
<td>6</td>
<td>Fall</td>
<td>806</td>
</tr>
<tr>
<td>7</td>
<td>Other unanticipated event</td>
<td>653</td>
</tr>
<tr>
<td>8</td>
<td>Medication error</td>
<td>475</td>
</tr>
<tr>
<td>9</td>
<td>Criminal event</td>
<td>425</td>
</tr>
<tr>
<td>10</td>
<td>Perinatal death</td>
<td>384</td>
</tr>
</tbody>
</table>

Medication Safety

Taiwan
• Taiwanese aged 65 and older with at least 1 chronic condition was 80.1% in 2010.
• 81.1% had received more than five prescriptions and 38.1% had major polypharmacy (>10)

U.S.A
• Medication nonadherence varied by disease, patient characteristics, and insurance coverage, with nonadherence rates ranging from 25% to 50%
• adherence leads to total health care cost savings

Applying National Health Insurance PharmaCloud System on Medication Safety

Dual-card Verification:
1. Medical Personnel’s Card
2. Patient’s NHI Card
Effectively Reducing Medication Duplication Day!

- Sedative-hypnotics, antipsychotics, Antidepressants: ↓ 67.2%
- Antihypertensive, antidiabetic, antihyperlipidemic: ↓ 41.4%

Graph showing the percentage reduction in medication duplication from 2015 Q1 to 2015 Q4:
- 2015 Q1: 1.596%
- 2015 Q2: 1.003%
- 2015 Q3: 0.594%
- 2015 Q4: 0.523%

The trend line indicates a significant decrease in medication duplication over the quarters.
Consequences of Medication adherence and nonadherence

• Patient nonadherence to prescribed medications is associated with poor therapeutic outcomes, progression of disease, and an estimated burden of billions per year in avoidable direct health care costs.
  

• Although improved medication adherence by people with four chronic vascular diseases increased pharmacy costs, it also produced substantial medical savings as a result of reductions in hospitalization and emergency department use.

• Programs to improve medication adherence are worth consideration by insurers, government payers, and patients, as long as intervention costs do not exceed the estimated health care cost savings.

  [HEALTH AFFAIRS 30, NO. 1 (2011): 91–99]
Developing Medication Non-adherence Screen Tool

Taiwan national health interview Survey 2009, Q4Y

Medication adherence

Medication nonadherence

Univariate Analysis

Multivariate logistic regression
discriminant analysis

FAST screen tool

• Cut-point 0.12, sensitivity 71.4%, specificity 47.2%
• Predictive performance, AUC 0.667

We find out one in 5 screened patients.
• Validation Cohort (2005), Fast screen tool is moderate to good performance.
2004~2015, Falls were the fifth most commonly reported Sentinel Event Reviewed by The Joint Commission

**Taiwan**
- 13.6% of elderly, fall-experience in one year
- A fall with severe injury increased 6.4 days of LOS.
- Increasing $778.

**Abroad**
- US, inpatient fall, 30-50 percent resulting in injury.
- a fall with injury added 6.3 days to the hospital stay.
- The average cost for a fall with injury is about $14,000.

Formosan J Med 2005 Vol.9 No.2
Hospital intranet retrieved
Falls event, Risk factor

12 items fall screen

≥5

Outpatient

Inpatient

Refer Case manager

Registered nurse

Refer Rehabilitation Clinic

Consult Prevention team

- Fear of fall scale
- 16Qs
- >23/64

- Fall prevention S.O.P
A drop Fall incidence rate from 1.0‰ to 0.8‰, Fall related injury rate 26.7%
Does Comprehensive Geriatric Assessment work on elderly care?

**Main results**

Twenty-two trials evaluating 10,315 participants in six countries were identified. Patients in receipt of CGA were more likely to be alive and in their own homes at up to six months (OR 1.25, 95% CI 1.11 to 1.42, P = 0.0002) and at the end of scheduled follow up (median 12 months) (OR 1.16, 95% CI 1.05 to 1.28, P = 0.003) when compared to general medical care.

In addition, patients were less likely to be institutionalised (OR 0.79, 95% CI 0.69 to 0.88, P < 0.0001). They were less likely to suffer death or deterioration (OR 0.76, 95% CI 0.64 to 0.90, P = 0.001), and were more likely to experience improved cognition in the CGA group (OR 1.11, 95% CI 0.20 to 2.01, P = 0.02). Subgroup interaction in the primary outcomes suggests that the effects of CGA are primarily the result of CGA wards.
Integrating Comprehensive Geriatric Assessment and Health Promotion Service
## Comprehensive Geriatric Care

### plus Age-Friendly Health Care

### Smoking cessation

### Alcohol cessation

### betel nut

### Exercise

### Diet

### Pain control
Patient education materials are accessible!
Pain Education

Individual Education

Group Education
### Comprehensive Geriatric Care plus Age-Friendly Health Care

#### Mental Health

<table>
<thead>
<tr>
<th>Psychological Status</th>
<th>No</th>
<th>Yes</th>
<th>1 point</th>
<th>2 points</th>
<th>3 points</th>
<th>4 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feelings of anxiety</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Feelings of sadness</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Feelings of depression</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Feelings of insomnia</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Screen**

**Assessment**

- **Screen Score**
  - Total: Normal range ≤ 6; Moderate 6-9; Severe 10-14; Very severe ≥ 15
  - Score of 10 or more suggests referral to a psychiatrist.

---

![Communication Skills Training](image-url)
Comprehensive Geriatric Assessment Integrated Health Promotion Service Improved Physical and Mental Health
Our experiences are:

- Cloud System + Hospital Intranet
- Efficiently Identify Risk
- Effectively Implement Prevention
- Comprehensively Improved Safety and Quality
Thanks for Your Attention.