Data of HIT and its Implication to Patient Safety

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Contents of Presentation

- Overview of Point of Act System (POAS)
- Benefit of Entire data of medical acts by POAS
- 5 Rights for patient safety
- HIT data and Evaluation for 5 Rights
The concept of the Hospital IT system in Japan

POAS: Real-time Consumption Data Capturing System

- Collects, manages, and uses consumption data at the point of consumption (e.g. Hospital bedside)
  - In the form of When, Where, Who, to Whom, Why, What, How (6W’s, 1H)
- Current technology is PDA/bar code, and RFID technologies are in processing.

Point of Act System (POAS) Overview

4 hospitals introduced POAS as health information system

- International Medical Center of Japan (925 Beds)
- Morioka Red Cross Hospital (464 Beds)
- Kyoto Second Red Cross Hospital (680 Beds)
- Japanese Red Cross Kochi Hospital (500 Beds)

International Medical Center of Japan (IMCJ) is Japan national center for advanced and pioneering medical care and have a function of national central hospital including care for VIP patients.

History of Implementation
5/2001  IMCJ
1/2003  Morioka
3/2003  Kyoto and Kochi
Concept of POAS

In real-time!

Entire Data of medical acts
By auto identification
electrical data capturing

1. Risk management
2. Hospital Management
3. Clinical Trial

For Risk Management, 2 aspects of Entire data
- Ensuring 5 Rights
- Research on causes of error and risk

Relationship between Entire data (Population) and Sampling data

There is a sampling error between sample and population. Standard Error is stochastic description of it based on statistical value. Though it is possible to estimate mean and proportion if data is enough, it is hard to deal with outliers and peculiar distributions.
**Relationship between Entire data (Population) and Sampling data**

- **Population**
- **Sample**
- **Population Value**
- **Sampling Error**
- **Sample Value**
- **Observed Value**

Taking improper sampling methods makes deviations.

**Benefit of Entire data**

<table>
<thead>
<tr>
<th>Population survey like census</th>
<th>Sampling Data</th>
<th>Entire data by POAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Reliability</td>
<td>Low</td>
<td>Relatively High</td>
</tr>
<tr>
<td>Cost to collect data</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Time difference</td>
<td>Long</td>
<td>Short</td>
</tr>
<tr>
<td>Sampling Error</td>
<td>Small</td>
<td>Big</td>
</tr>
</tbody>
</table>
**Entire data and Patient Safety Research**

- Frequency of medical error and adverse events is low
  - Need a big sample to detect them and estimate probable number of them.

- Process data captured by POAS is good source for finding cause of medical accident.

New evidence for Patient Safety by HIT

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**5 Rights are essential for Patient Safety**

**Five Rights**

- **Right Patient**
- **Right Drug**
- **Right Dose**
- **Right Route**
- **Right Time**

Health Information system can contribute to ensure 5 Rights of Medication

- by Prevention at point of care for right patient, right drug and right dose
- by Data captured by IT
“Right Route” Medication

Traceability from production to Consumption

Outside Hospital

Inside Hospital

Right route need tracking log to manage quality of drugs and right process of medication

Example Data Capture: Inside Hospital

Traceability by Single item management using Serialized GTIN (SGTIN) across different system
“Right time” medication

“Right time” medication is good for preventing medical error, hospital management and patient satisfaction.

Example) Early Injection would be a cause of error or ineffective medication.

Scheduled Order Time

Evaluation of “Right time” Medication

Data used for evaluation

From July to September 2007 in IMCJ

Data is including 306768 drugs taken in all injections during the term at every ward in IMCJ.
Evaluation for “Right time” medication

- **Indicator for Right time medication “Shorter is better”**

  **Early Injection**
  Administrated more than 1 hour earlier

  **Early Mixing**
  Mixing administrated more than 3 hour earlier

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Result

**Records of all orders and Injections**

- Deviation of distribution of Order time is high

- To complete these orders, Nurses adjust injection time.
Result

Time rightness of injection

\[(\text{Time between scheduled order time and injection}) = (\text{Injection Time}) - (\text{Scheduled Order Time})\]

**Early Injections**
6.8% injections were administrated more than 1 hour earlier.

Result

Time rightness of Mixing

\[(\text{Time between mixing and scheduled order time}) = (\text{Scheduled Order time}) - (\text{Mixing time})\]

**Early Mixing**
30.5% mixings were administrated more than 3 hour earlier.

**Late Administration**
Mixings administrated after scheduled time.
Conclusion

HIT data is useful for Patient safety ---

- Ensuring 5 rights by recording all medical acts
- Low cost research for patient safety including process of medical acts.

References:
