Development of a regional ICU database for longitudinal ICU performance monitoring:

Summary and Way forward

HA Convention
15 May 2013
The presentation

• Contain two parts:
  • Summary of what we have achieved
  • Experience sharing from management perspective, consider the lessons to be learnt (Briggs, 2001)
Our Challenges

• ICU is the most expensive, technologically advanced and resource-intensive area of medical care.

• The service is so scarce and it is usually only offered to those whose condition is potentially reversible and who have a good chance of surviving with intensive care support.

• Since the critically ill are so close to dying, the outcome of this intervention is difficult to predict.
Methodology

- Case mix: heterogeneity in the ICU patients’ severity of illnesses

- Differences across institutional settings

- Risk-adjusted model to tackle the confounders

- APACHE (Acute Physiology and Chronic Health Evaluation) was chosen as the standard tool and validated benchmark index for ICU outcome prediction and performance assessment
Milestones

• 2007: with the support from the Head Office IT and Statistics Departments, an APACHE data entry interface with extensive built-in logic and data check was built in the HA Clinical Management System (CMS)

• 2008: APACHE IV (the latest version of APACHE) score calculators to do the back end score calculation

• 2008: User-friendly prognostic score reporting function was added in the Clinical Data Audit and Research System (CDARS)

• 2009: Designated ICU data collection team was set up to alleviate the ICU frontline clinical staff’s workload in data collection and data entry
CMS APACHE Form
CDARS APACHE Standard Reports

Step 1: Specify the Reporting Period by:
- Reporting Period Type: Quarterly, Half-yearly, Yearly
- Selected Reporting Period: From: 2012 To: 2012

Step 2: Specify Study Hospital:
- Hospital: All Hospitals

Step 3: Specify Report Layout:
- Report Layout: Table C4a - Summary Report (APACHE IV risk-adjusted analysis for non-CABG patients)

Step 4: Specify ICU Type:
- ICU: ICU, ICU+HDU
- ICU+HDU means direct admission or transfer-in from other specialty to ICU or HDU sub-speciality, including within sub-specialty transfer between ICU and HDU

Step 5: Specify Admission Type:
- Admission Type: First Admission, All Admissions
Milestones (2):

- 2011: Local benchmarking by using 2007 to 2011 data
  - The performance fluctuation spotted was fed back to the individual ICU and hospital management for the respective exploration and service improvement.

- 2012: Benchmark HA ICU data with about 200 ICUs in the UK (collaboration with the Intensive Care National Audit and Research Centre, ICNARC) with recalibrated APACHE model
Benchmarking

• Is best suited to high-performance companies that are attuned to the need to adapt to best practice

• To address exceptional events or performance
Example

HA's ICU Risk-adjusted Outcome in 2007 to 2011

Lower is better
Example (cont’d)

• Good practice observed in a unit with consistent good performance:

1. All team members work and cooperate together with high morale
2. Adopted the hospital approach of Crew Resource Management to improve patient safety
3. Promoting learning culture within the department
4. Successful implementation of ICU Clinical Information System (CIS). Medication incidence has decreased dramatically since implementation.
Our sharing...

• Everything talking about resources:
  • IT system development (time and money)
  • Data collection (technology and manpower)
  • Data analysis (expertise, other contextual information)
  • Data reporting (sensitive to the political context of the public reporting process)
  • How can these be sustainable? By what way?

• Useful for Service planning
  • Can it tell good pattern of service delivery?
  • E.g. How many ICU should we have?
  • E.g. How many beds should an individual ICU have?
Reviewing Organisational Performance

• Griffith & Alexander (2002):
  • Clear strategic guidance, leadership and planning are essential, particularly when alternative targets compete for limited resources
  • This is especially critical for uniting existing and new improvement activities into a systematic, organisational-wide approach.
Way forward

OTOMIP
ICU Database
Trauma Registry

SOMIP

PCI audit
Other clinical registries

CE&TM/MPG

NeuroMIP

Clinical Service Improvement Program
Acknowledgments

• COC (ICU)
• HO Statistics & Workforce Planning
• HO Health Informatics and IT