Implementing the Quality Feedback Loop
to improve and drive change

An Australian Cardiac Procedures Registry Perspective

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Quality Feedback Loop

1. Collect information about activities and outcomes
   - Monitor changes
2. Implement changes in activities to improve activities & outcomes
3. Share information with interested and appropriate others (MHWG, supervision)
4. Develop ideas for changing practice to meet expectations
5. Reflect on information: Does it meet expectations?
Collecting the Information – Clinical Registries

• Quality Assurance function
  – Benchmarking of national standards
  – International comparisons
  – High quality and poor performance

• Monitor trends
  – Patient characteristics
  – Procedure details

• Monitoring outcomes
  – Morbidity / Mortality / Treatment / Guidelines
  – Appropriate risk modelling

Improving Patient Outcomes
Who benefits from a registry?

- **Providers**
  - Quality assurance
  - Credentialing

- **Payers**
  - Cost – benefits
  - Quality assurance

- **Policy Makers**
  - Workforce planning

- **Consumers**
  - Healthcare System confidence

- **Researchers**

- **Educators**
International Activities

The Society of Thoracic Surgeons
ENHANCING THE ABILITY OF CARDIOTHORACIC SURGEONS TO PROVIDE THE HIGHEST QUALITY PATIENT CARE THROUGH EDUCATION, RESEARCH, AND ADVOCACY

The European Association for Cardio-Thoracic Surgery

Third European Adult Cardiac Surgical Database Report
2006

The Society of Cardiothoracic Surgeons of Great Britain and Ireland

Fifth National Adult Cardiac Surgical Database Report
2003
Improving outcomes for patients
What’s happening in Cardiac Registries in Australia?

### ASCTS Registry

- Demonstration project – needs analysis 1999
- Establishment of ASCTS Database Committee 2000
- Secured VDHS funding 2001
- Initial paper form converted to database product 2003
- Secured further VDHS funding 2004
- Initial 12 month public report and HLC publication 2004
- Interstate Involvement / Research Committee 2005
- Web based collection system 2008
- 26/26 Surgical Units around Australia 2012
Other Cardiac Registry Initiatives

- Heart Foundation / AIHW
- GRACE / ACACIA Registry
- Melbourne Interventional Group
- Australian Cardiac Procedures Registry
- Snapshot ACS
- Victorian Cardiac Outcomes Registry (VCOR)
- Queensland Network initiative
Operating Principles for Cardiac Registries

- Ethics & Governance
- Core Minimum Dataset
- Security Issues
- Quality Issues
  - completeness, accuracy & timing
- Data Custodianship
- Analysis & reporting
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Registry Data Reporting

Public Report
- 30 day mortality
- characteristics

Hospital Reports
- Identify Units to themselves
- 5 KPI’s

Surgeons report
- highly detailed
- all procedures and outcomes
RESEARCH


Diem T Dinh, Geraldine A Lee, Baki Billah, Julian A Smith, Gilbert C Sharley and Christopher M Reid

MJA, 2008
Health Care or Research?

 HEALTH CARE

Use of drug-eluting stents in Victorian public hospitals

Bryan P Yan, Andrew E Ajani, Stephen J Duffy, Gishel New, Mark Horrigan, Gregory Szto, Antony Walton, David Eccleston, Jeffery Lefkovits, Alexander Black, Martin Sebastian, Angela L Brennan, Christopher M Reid and David J Clark on behalf of the Melbourne Interventional Group (MIG) investigators

MJA, 2007
• **Identification of Outliers**
  - What method?
  - Control charts, Cumulative sum plots

• **How to present data?**

• **Peer review process**

• **Public Availability?**

• **Can we avoid league tables?**

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![Graph showing Cumulative Expected vs. Observed Mortality](image_url)
The New York State Cardiac Registries

History, Contributions, Limitations, and Lessons for Future Efforts to Assess and Publicly Report Healthcare Outcomes

Edward L. Hannan, PhD,* Kimberly Cozzens, MA,* Spencer B. King III, MD,† Gary Walford, MD,‡ Nirav R. Shah, MD§

Albany, New York; Atlanta, Georgia; and Baltimore, Maryland
History of Public Reporting

1990 – NY State – hospital specific
1992 – NY State – surgeon specific
1992 – Pennsylvania & others

Intense criticism
- Inappropriate risk adjustment
- Avoidance of high-risk cases
- Flawed administrative databases
- Untrained journalists
Fig 1. The observed mortality rates and 95% confidence intervals are shown for 175 surgeons. This graph plots the risk-adjusted 30-day mortality rates after coronary artery bypass grafting in New York between 1997 and 1999 and shows the ranked rates for individual surgeons with 95% confidence intervals. In the original publication of these data, the surgeons were named. The widths of the confidence intervals in this figure reveal considerable uncertainty about the true underlying mortality rates; however, this uncertainty is not reflected in the rank given to a surgeon. This figure was reproduced with permission from the following publication [18]: Spiegelhalter DJ. League tables. In: Armitage P, Colton T, eds. Encyclopaedia of Biostatistics. Chichester, U.K.: John Wiley and Sons; 2005:2478–751.


League Tables

“Fundamentally flawed, unnecessary and inappropriate”

- No adjustment for sample size
- No adjustment for random variation
- No accounting for “no true difference”
Substantial uncertainty
Wide CI’s
Only 2 of 175 can be confidently placed in the lowest mortality quartile
Only 6 in the highest mortality
Quartile

Thus, “any ‘league table’ is largely spurious, apart from possibly identifying some extreme cases that can confidently be placed in, say, the top or bottom quarter”

Fig 2. The median estimates and 95% intervals are shown for true ranks of 175 New York surgeons. If one thinks of the intervals in Fig 1 as expressing probability distributions for the true mortality rates, and one then samples those distributions and ranks each of the generated samples, a set of plausible “true ranks” for the surgeons is created, as shown in Fig 2. The true ranks in Fig 2 show substantial uncertainty, with most surgeons having a very wide interval (only 2 out of 175 can be confidently placed in the “best” quarter, and only 6 in the “worst” quarter). This figure was reproduced with permission from the following publication [18]: Spiegelhalter DJ. League tables. In: Armitage P, Colton T, eds. Encyclopaedia of Biostatistics. Chichester, U.K.: John Wiley and Sons; 2005:2478–751.

Heart surgery 'more successful'

Outcomes for adult cardiac patients in the UK have improved significantly since publication of information on death rates, research suggests.

The study also found more elderly and high-risk patients were now being treated, despite fears surgeons would not want to take them on.

It is based on analysis of more than 400,000 operations by the Society for Cardiothoracic Surgery.

Experts said all surgical specialties should now publish data on death rates.

It had been feared that publication of death rates could put patients off treatment.
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CCRE Therapeutics

MONASH University
Driving Change

- Implementation of Evidence based “best practice”
  - Implementation Research

- Generation of new knowledge of what works best in practice
Comparative Effectiveness Research

- Comparative effectiveness research
  - Designed to inform health-care decisions by providing evidence on the effectiveness, benefits, and harms of different treatment options.
  - The evidence is generated from research studies that compare drugs, medical devices, tests, surgeries, or ways to deliver health care.

- There are two ways that this evidence is found:
  - Researchers look at all of the available evidence about the benefits and harms of each choice for different groups of people from existing clinical trials, clinical studies, and other research.
  - Researchers conduct studies that generate new evidence of effectiveness or comparative effectiveness of a test, treatment, procedure, or health-care service.
## EBP – Current View

<table>
<thead>
<tr>
<th>Evidence generation</th>
<th>Can it work? (Efficacy)</th>
<th>Does it work? (Effectiveness)</th>
<th>Is it worth it? (Cost-Effectiveness)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical trials</td>
<td></td>
<td></td>
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<tr>
<td>Systematic reviews</td>
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<td>Clinical guidelines</td>
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<td>Various methods</td>
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<tr>
<td>Regulatory approval</td>
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<td>Clinical practice</td>
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<td></td>
<td>Health policy</td>
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Danny Liew, 2012

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CCRE Therapeutics
## EBP – Ideal View

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<tr>
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<th>Does it work? (Effectiveness)</th>
<th>Is it worth it? (Cost-Effectiveness)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence synthesis</td>
<td>Clinical trials</td>
<td>Epidemiology, Registries</td>
<td>Costing Studies</td>
</tr>
<tr>
<td>Decison-making</td>
<td>Systematic reviews</td>
<td>Comparative effectiveness research</td>
<td>Health Technology assessment</td>
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Danny Liew, 2012
Generating evidence to drive change

Registry Data + Specific trial related data = Cost Effective Clinical Trials
Registry Compass – ANZSCTS Registry

**Registry compass**

- Governance and Control
- Designing Measures
- Driving Change
- Collecting Data
- Analyzing & reporting

**Category scores**

- **Designing measures**
  - AUS score: 3.8
  - Avg. of all registries: 3.9
  - Avg. of coronary reg.'s: 3.8

- **Collecting Data**
  - AUS score: 4.0
  - Avg. of all registries: 3.9
  - Avg. of coronary reg.'s: 3.5

- **Analyzing and reporting**
  - AUS score: 3.8
  - Avg. of all registries: 3.7
  - Avg. of coronary reg.'s: 4.0

- **Driving change**
  - AUS score: 2.3
  - Avg. of all registries: 2.7
  - Avg. of coronary reg.'s: 3.0

- **Governance and control**
  - AUS score: 4.3
  - Avg. of all registries: 3.7
  - Avg. of coronary reg.'s: 4.3

*Boston Consulting 2012*
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Issues to be addressed in the CRE research program include:

- Maximising and initiating the use of routinely collected clinical information to inform on the safety and quality of cardiovascular care

- Enhancing the use of evidence based best practice in the provision of cardiovascular interventions and therapeutics

- Informing policy makers and consumers on the cost-effectiveness of driving change in the delivery of health services based on translation of evidence into clinical practice
CRE in Cardiovascular Outcomes Improvement

CRE Research Strategy & Framework
- Surgery
- PCI
- ACS
- AF
- HF

Cardiac Registries & Clinical Networks
- Guideline Implementation research
- Benchmark Quality & Safety
- Improve Patient Outcomes
- Impact Health Policy

Epidemiological Modelling & Health Economics

Comparative Effectiveness Trials
Driving Change

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What's the future for Cardiovascular registries?