The Congenital Audit
&
Outlier Management

David Barron
How do the adult and congenital audits differ?

Outlier Management and the need for greater clarity on process

An example of outlier management
How do the adult and congenital audits differ?

All analysis done by NICOR
Strong Clinical Influence in Steering Group

Joint analysis of Interventional Cardiology & Surgery

All reporting is Unit Specific NOT surgeon specific

There are 57 separate funnel plots for procedures
AND a Risk Adjusted Aggregate outcome analysis for entire surgical caseload

Everything goes into the analysis: high risk / emergency caseload included
Validation Process

All centres receive an Annual Validation Visit:
  NICOR analyst plus volunteer clinician

20 case notes randomly selected – every data-field validated

Theatre logbooks checked against returns

All deaths checked for accuracy

Produce a validation report for each centre:
  includes a Data Quality Index which is published in the Annual Report

Expensive  Time Consuming

Adult Congenital Centres: too many to visit
  ? One random visit per year
Data Submission and Timelines

Mirrors the adult dataset

Database managers submit quarterly

Data is checked by NICOR for accuracy

Two passes back and forth to data manager

Final sense check prior to analysis

If fail to respond – phone-call from NICOR to lead surgeon
Fifty Seven Individual Funnel Plots

**Alert** 98%
1 in 40 risk of hitting alert by chance

**Alarm** 99.5%
1 in 1000 risk of hitting alarm by chance
Aggregate Risk-Adjusted Analysis

**PRAiS Model:** Partial risk adjustment in Surgery

Derived from UK data

Alert: 97.5%

Alarm: 99.9%

1 in 4 risk of an alert by chance

1 in 100 risk of an alarm by chance
Real-Time VLAD Chart Monitoring

Part of PRAiS: Provided free-of-charge to all units
Outlier Management

Green or Red Outlier Identified

Phone-call to audit lead

Letter to LEAD SURGEON, DATA MANAGER & GOVERNANCE LEAD

JOINT letter signed by Chair of NICOR Congenital Steering Group
President BCCA
President SCTS

Data Error, no case to answer

Double-Check all data

Data Correct – case to answer

Second Letter to LEAD SURGEON, DATA MANAGER & CHIEF MEDICAL OFFICER

JOINT letter signed by Chair of NICOR Congenital Steering Group
President BCCA
President SCTS
Detection and management of outliers

Guidance prepared by National Clinical Audit Advisory Group

2011 Guidance

-No distinction between alert and alarm

-No distinction between single procedure and aggregate outliers
Outlier Management – Case to Answer

Internal review and analysis

Response to NICOR

Typical Actions:
- Change in Protocols
- Programme of mentorship
- Peer review
- Change in technique
- Change in workforce

Role of NICOR unclear       Role of SCTS unclear       Role of HQIP unclear

? When is an external review merited ?
? Role of the Independent Review Mechanism ?
Annual Report

National Congenital Heart Disease Audit Report 2010/13

Good.... But not the Blue Book
<table>
<thead>
<tr>
<th>Code</th>
<th>Unit</th>
<th>Surgical Episodes</th>
<th>Actual Survival</th>
<th>Predicted Survival</th>
<th>Actual Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVE</td>
<td>Belfast, Royal Victoria Hospital</td>
<td>232</td>
<td>98.3%</td>
<td>98.4%</td>
<td>0.999</td>
</tr>
<tr>
<td>HSC</td>
<td>London, Harley Street Clinic</td>
<td>483</td>
<td>97.9%</td>
<td>97.2%</td>
<td>1.007</td>
</tr>
<tr>
<td>GRL</td>
<td>Leicester, Glenfield Hospital</td>
<td>570</td>
<td>97.9%</td>
<td>97.4%</td>
<td>1.005</td>
</tr>
<tr>
<td>FRE</td>
<td>Newcastle, Freeman Hospital</td>
<td>704</td>
<td>97.7%</td>
<td>97.1%</td>
<td>1.006</td>
</tr>
<tr>
<td>OLS</td>
<td>Dublin, Our Lady's Children's Hospital</td>
<td>738</td>
<td>97.0%</td>
<td>97.8%</td>
<td>0.992</td>
</tr>
<tr>
<td>RHS</td>
<td>Glasgow, Royal Hospital for Sick Children</td>
<td>817</td>
<td>96.8%</td>
<td>97.6%</td>
<td>0.992</td>
</tr>
<tr>
<td>BRC</td>
<td>Bristol Royal Hospital For Children</td>
<td>886</td>
<td>97.6%</td>
<td>98.1%</td>
<td>0.995</td>
</tr>
<tr>
<td>SGH</td>
<td>Southampton, Wessex Cardithoracic Centre</td>
<td>914</td>
<td>98.5%</td>
<td>97.7%</td>
<td>1.008</td>
</tr>
<tr>
<td>L6I</td>
<td>Leeds General Infirmary</td>
<td>919</td>
<td>96.5%</td>
<td>97.8%</td>
<td>0.987</td>
</tr>
<tr>
<td>NHB</td>
<td>London, Royal Brompton Hospital</td>
<td>1117</td>
<td>98.4%</td>
<td>98.0%</td>
<td>1.004</td>
</tr>
<tr>
<td>GUY</td>
<td>London, Evelina Children’s Hospital</td>
<td>1165</td>
<td>96.4%</td>
<td>97.2%</td>
<td>0.992</td>
</tr>
<tr>
<td>ACH</td>
<td>Liverpool, Alder Hey Hospital</td>
<td>1195</td>
<td>96.7%</td>
<td>97.3%</td>
<td>0.993</td>
</tr>
<tr>
<td>BCH</td>
<td>Birmingham Children’s Hospital</td>
<td>1467</td>
<td>97.0%</td>
<td>96.6%</td>
<td>1.004</td>
</tr>
<tr>
<td>GOS</td>
<td>London, Great Ormond Street Hospital for Children</td>
<td>1828</td>
<td>98.2%</td>
<td>97.8%</td>
<td>1.005</td>
</tr>
</tbody>
</table>
Example:

Unit X found to be an outlier at the alert level for aggregate data

Letter goes from SCTS/NICOR/BCCA to inform of outlier status

President SCTS speaks with lead surgeon
Response to the ‘Case to Answer’

1. Comprehensive internal review of practice

2. Change in personnel has taken place subsequent to the 2009-12 analysis

3. External review of practice had been held the previous year and made series of recommendations that have already been implemented
Real-Time VLAD Plots

VLAD Chart from 01/04/2012 to 31/03/2014

Total number of 30-day survivors = 671
Total number of 30-day deaths = 14
Real-Time VLAD Plots

VLAD Chart from 10/04/2013 to 31/03/2014

Total number of 30-day survivors = 361
Total number of 30-day deaths = 3

(Expected - Actual) Deaths within 30 Days

- VLAD chart
- Surgical reinterventions
- Catheter reinterventions
- Surgical and catheter reinterventions
Resolution

NICOR and SCTS satisfied with evidence provided
VLAD plots provide convincing evidence of improving practice

Validation visit confirms all VLAD data is accurate

SCTS speaks with CQC who confirm they are satisfied that practice is safe.

SCTS able to secure formal ‘closure’ from the CQC
and reassure the unit that no further measures are necessary
Summary:

Strengths

Strong data validation
Steering Committee Clinically Led
Very little excluded from the dataset
Unit specific outcomes
Alert and Alarm only
Aggregate Risk-Adjusted Analysis
Clear Engagement of the SCTS with NICOR
Real-time VLAD analysis
Summary:

Need for Improvement

. Less lag between submission and publication
. Clarification of the roles of NICOR, HQIP, CQC and the Professional Societies
. Clear guidelines for management of an Alert and management of an Alarm
. Better Instruction to Trusts and Medical Directors in how to respond to both
. Concern that continually re-calibrating the model against the current data will generate unnecessary ‘outliers’
. Need for a ‘Blue Book’ equivalent for Congenital
• 50% of deaths are referred to the coroners
• Half of these have a PM
• 5% of all deaths also have an inquest
  – But for Congenital heart procedures it is 15%
• Inquest delays vary considerably

ONS do not record you as dead until inquest complete
35% take over 6 months
70% take over 3 months