Audit and Data versus Research

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Quality in healthcare

- Clinical audit provides support for clinical governance and indicates where performance gaps exist
- Used as a quality improvement process
- The aim of audit is to provide evidence of clinical care meeting expected or acceptable standards as described in guidelines
  - When standardised, can be used to monitor change in practice and enable reliable benchmarking between services
  - Often low cost in time commitment depending on available support for analytics and size of audit
  - Competes with direct patient care tasks
Ignorance is bliss!
The essence of clinical audit

Systematic process

What should we be doing?

Are we doing it?
Are we similar to other services?

Where care gaps exist how can we improve?
Clinical Audit Cycle

1. Audit
2. Compare practice against standard or benchmark
3. Identify care gaps
4. Implement changes
5. Re-Audit
6. Expected standard of care

Adapted from National Institute for Clinical Excellence “Principles for best practice in clinical audit”, 2002
The evidence for Audit and Feedback

- Systematic review evidence\(^2\): 140 RCTs of audit/feedback
  - Median effect size 4.3% change IQR: +0.5% to 16%
- Audit and feedback alone is not always effective in providing effective change in clinical practice\(^2\)
  - Need to consider who receives the feedback, format, when and how much\(^3\)
- No compelling evidence that multifaceted interventions are more effective than single-component interventions\(^4\)
- Importance of identifying clinical and organisational barriers
- Audit, combined with action-planning workshops and follow-up may be more effective for improving care\(^5\)

Successful implementation is dependent on aligning the available evidence to the particular practice context through the ‘active’ ingredient of facilitation\(^6\)

- Other
  - Behaviour change wheel\(^7\)
  - Theoretical domains framework for systematic barrier assessment\(^8\)

\(^6\)Harvey and Kitson, University of Adelaide 2015; \(^7\)Michie et al. Implementation Science 2011; \(^8\)Michie et al. Qual Saf Health Care 2005
Audit methodology

- Existing tool or designed by experts or individuals
- Data collection:
  - paper-based, administrative systems, online tools
  - single service or multiple services
- Anonymous versus identifiable data
  - Relevant to outcome assessment and data quality checks
- Prospective or retrospective cross-sectional samples or continuous measurement (i.e. clinical registries)
- Random selection or consecutive cases
- Externally collected/analysed or done internally
Collection of Clinical Audit Data

Potential Limitations

- Case identification based on inaccurate data
- Potential for different forms of bias
  - Reporting bias: “if it wasn’t’ documented it didn’t occur”
  - Data may not be representative of all cases within service
- Reproducibility and reliability
  - Questions that rely on subjective criteria
  - Quality of data i.e. missing data/ poor inter-scorer reliability
- Tool modifications:
  - New evidence
  - Difficult to make reliable comparisons over time
Improving the quality of audit data

- Pilot testing data collection tools
- Standardised data collection tools
- Reliability:
  - Training, help notes and data dictionary
  - Consistency between data abstractors
- Data collection via web tools with mandatory fields and inbuilt logic checks
- Data cleaning process
- Data independently analysed
- Verification of case eligibility or other information using multiple reference sources
Audit or Research?

As the distinctions are blurred, why don't we just lump 'research' & 'audit' together to make 'readit'!!?
Ethical Considerations

- Regardless if an activity is quality improvement or research, it must be ethically conducted
- May only require low/negligible risk HREC review
- Triggers for consideration of ethical review\(^9\)
  - the activity infringes the privacy or professional reputation of participants, providers or organisations
  - Secondary use of data- publication of aggregated/pooled data
  - Gathering information about participants beyond what is collected routinely e.g. additional blood tests
  - Collection of personal information

\(^9\)National Health and Medical Research Council, 2014
Some distinctions

Audit

- Coincidental to standard operating procedures to assess performance not usually published
  - Internal reviews separate to a research activity
- Can lead to new research questions related to how we improve such as implementation research

Research

- Developing new knowledge to contribute to the field
- Provides evidence of the effectiveness of policies, guidelines or implementation activities
- Usually a one-off study initiated by researchers
- Secondary use of data e.g. health services research
<table>
<thead>
<tr>
<th></th>
<th>Research</th>
<th>Clinical Audit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence generation</td>
<td>Creates new</td>
<td>Tests previous</td>
</tr>
<tr>
<td>Hypothesis</td>
<td>![Checkmark]</td>
<td>![X]</td>
</tr>
<tr>
<td>Methods</td>
<td>RCTs/ observational</td>
<td>Cross-sectional</td>
</tr>
<tr>
<td>Randomisation</td>
<td>+/- -</td>
<td>No</td>
</tr>
<tr>
<td>Timeframe</td>
<td>varies</td>
<td>varies</td>
</tr>
<tr>
<td>Ethics</td>
<td>Always</td>
<td>Possibly</td>
</tr>
<tr>
<td>External support</td>
<td>+/- -</td>
<td>+/- -</td>
</tr>
<tr>
<td>Personal information</td>
<td>+/- -</td>
<td>+/- -</td>
</tr>
<tr>
<td>Outcome data</td>
<td>+/- -</td>
<td>+/- -</td>
</tr>
<tr>
<td>Influences clinical practice</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
</tr>
<tr>
<td>Risk of bias</td>
<td>Less pronounced with controlled designs</td>
<td>Sample size / number of sites/ quality of documentation</td>
</tr>
<tr>
<td>Costs/ technical skills</td>
<td>+++</td>
<td>+</td>
</tr>
</tbody>
</table>

Adapted from United Bristol Healthcare NHS Trust Clinical Audit Central Office. (2005). *What is Clinical Audit?*
Synergies between Audit and Research

- Audits provide a source of natural history observational data of current practice
- Audits may be part of a larger program of work that can be used to support research
  - Pooled data used to answer important policy or practice research questions
  - Collect once ‘use many’ – maximises the effort of data collection
  - Important to partner with academics for mentoring and technical support
Examples of large Australian audit programs of stroke care in hospitals

- **Stroke Foundation – National Stroke Audit**
  - Acute and rehabilitation hospitals

- **New South Wales Stroke Audit Program**
  - Acute public hospitals in NSW
<table>
<thead>
<tr>
<th></th>
<th>Stroke Foundation Audits</th>
<th>NSW Stroke Audit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location</strong></td>
<td>Acute &amp; Rehabilitation Nationally</td>
<td>Acute hospitals in NSW</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>Biennial</td>
<td>Pre-Post: Following stroke service enhancements</td>
</tr>
<tr>
<td><strong>Purpose</strong></td>
<td>Measure adherence to national guidelines</td>
<td>Measure change in adherence to selected evidence-based processes</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>Retrospective medical record</td>
<td>Retrospective medical record</td>
</tr>
<tr>
<td><strong>Hospitals involved</strong></td>
<td>112 (2015)</td>
<td>46 hospitals (since 2002)</td>
</tr>
<tr>
<td><strong>Cases audited</strong></td>
<td>40 each hospital</td>
<td>50-100 each hospital</td>
</tr>
<tr>
<td><strong>Data collection</strong></td>
<td>Internal Webtool</td>
<td>Internal &amp; external Paper teleforms</td>
</tr>
<tr>
<td><strong>Data analysis</strong></td>
<td>External</td>
<td>External</td>
</tr>
<tr>
<td><strong>Feedback</strong></td>
<td>National &amp; Site Report (QLD-included facilitated feedback)</td>
<td>Individual Site Report (2014-2015 active peer support feedback facilitation)</td>
</tr>
<tr>
<td><strong>Used for Research</strong></td>
<td>✅</td>
<td>✅</td>
</tr>
</tbody>
</table>
Stroke Foundation Acute Services Audit

Total cases audited per year


- Audits
- Hospitals

Hospitals participating per year


- Audits
- Hospitals
### Acute Stroke Clinical Standards

<table>
<thead>
<tr>
<th>Standard</th>
<th>Australia (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment in emergency department</td>
<td>1,294 (38)</td>
</tr>
<tr>
<td>Thrombolysis in ischaemic stroke patients</td>
<td>231 (8)</td>
</tr>
<tr>
<td>Thrombolysis within 60 minutes of hospital arrival</td>
<td>59 (26)</td>
</tr>
<tr>
<td>Admission to a stroke unit</td>
<td>2,724 (67)</td>
</tr>
<tr>
<td>Discharged on statin, antihypertensive and antithrombotic medication</td>
<td>137 (66)</td>
</tr>
<tr>
<td>(ischaemic stroke)</td>
<td></td>
</tr>
<tr>
<td>Risk factor modification advice before leaving hospital</td>
<td>1,273 (56)</td>
</tr>
</tbody>
</table>

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11 National Stroke Foundation 2015 Acute Services Clinical Audit
### Changes over time - Acute Services Audit

<table>
<thead>
<tr>
<th>Service</th>
<th>2009 (%)</th>
<th>2011 (%)</th>
<th>2013 (%)</th>
<th>2015 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received stroke unit care</td>
<td>49</td>
<td>59</td>
<td>58</td>
<td>67</td>
</tr>
<tr>
<td>Assessed by physiotherapist &lt; 48 hrs</td>
<td>60</td>
<td>65</td>
<td>69</td>
<td>68</td>
</tr>
<tr>
<td>Ischemic stroke</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received intravenous thrombolysis</td>
<td>3</td>
<td>7</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Antithrombotics on discharge</td>
<td>95</td>
<td>97</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>Received behaviour change education</td>
<td>43</td>
<td>47</td>
<td>46</td>
<td>56</td>
</tr>
</tbody>
</table>

- Highlights improvements over time, care gaps and where there has been stagnation
- Areas where adherence is high (? value in collecting)
Feedback: Stroke Foundation Audit

- Aggregated data presented in a national report
- Individual site reports provided
  - Benchmarking at state and national level

### Acute Stroke Clinical Care Standard Indicator

<table>
<thead>
<tr>
<th>Acute Stroke Clinical Care Standard Indicator</th>
<th>Your site % or median</th>
<th>National benchmark %</th>
<th>National average n (%) or median (IQR)</th>
<th>National ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment in the emergency department ^</td>
<td>49%</td>
<td>81.4</td>
<td>1294 (38)</td>
<td>34 / 94</td>
</tr>
<tr>
<td>Median time (mins) of brain scan from arrival to ED ^</td>
<td>1:28</td>
<td>N/A</td>
<td>1:32 (0:46-3:05)</td>
<td>N/A</td>
</tr>
<tr>
<td>Thrombolysis in ischaemic stroke (with exclusions) *</td>
<td>13%</td>
<td>30.7</td>
<td>231 (8)</td>
<td>23 / 72</td>
</tr>
</tbody>
</table>
N=68 hospitals; 2,119 cases audited, NSF 2008 rehabilitation audit

N=89 hospitals; 2,724 cases audited; NSF 2007 acute audit
Evaluation of Rural Stroke Services: Does Implementation of Coordinators and Pathways Improve Care in Rural Hospitals?
Dominique A. Cadilhac, Tara Purvis, Monique F. Kilkenny, Mark Longworth, Katherine Mohr, Michael Pollack and Christopher R. Levi
on behalf of the New South Wales Strokes Services Coordinating Committee and the Agency for Clinical Innovation

N=8 hospitals; pre-post design; 1,480 cases audited; pre (750 cases) post (730 cases)

Are patients with intracerebral haemorrhage disadvantaged in hospitals?
Renee Sheedy¹,², Julie Bernhardt²,³, Christopher R. Levi⁴, Mark Longworth⁵, Leonid Churilov³, Monique F. Kilkenny³,⁶, and Dominique A. Cadilhac³,⁶* on behalf of the New South Wales Stroke Services Coordinating Committee and the Agency for Clinical Innovation

Background and Aims Providing evidence-based clinical care reduces disability and mortality rates following stroke. We

N= 32 hospitals; 3,846 cases; admissions between 2003 and 2010
Summary

- Audit data are valuable for:
  - identifying care gaps
  - monitoring change in practice over time
  - performing reliable benchmarking

- To maximise benefits of audit ensure use of a theory informed quality improvement activity
  - “close the loop”

- Ethical considerations for audit are important

- Synergies between audit and research
  - ‘Collect once use many’ – maximise the use of your data
  - The better the quality of audit data the greater chance it can be used to answer important, everyday questions.
Data collection shouldn’t bog you down!!
Regular sources of performance data help you understanding the strengths and limitations of your health care service.
Acknowledgements

- National Stroke Foundation
  www.strokefoundation.com.au

- Agency of Clinical Innovation and local hospital staff who assisted with data collection for the NSW audits

- Tara Purvis for her contribution to this presentation

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References

- National Health and Medical Research Council. Ethical Considerations in Quality Assurance and Evaluation Activities, 2014
Thank you