Measurement and Monitoring of Safety
The role of the Patient Safety Measurement Unit
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Patient Safety Measurement Unit

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University of Oxford
Oxford Academic Health Science Network
Evangelists & snails

‘Run don’t walk’

‘The correct question is whether there is a rationale for withholding critical care resources from critically ill patients outside the intensive care unit. The answer is obvious. No’

Walk, don’t run

‘In view of the limitations of the evidence and the heterogeneity of study results it seems premature to declare Rapid Response Teams as the standard of care’.

Davidoff, 2011
Cutting error and harm by 50% within 5 years
Sensitivity of routine system for reporting patient safety incidents in an NHS hospital: retrospective patient case note review
Ali Bahu-Akbari Sari, Trevor A Sheldon, Alison Cracknell, Alastair Turnbull

Abstract

Objective To evaluate the performance of a routine incident reporting system in identifying patient safety incidents.

Design Two stage retrospective review of patients’ case notes and analysis of data submitted to the routine incident reporting system on the same patients.

Setting A large NHS hospital in England.

Population 1006 hospital admissions between January and May 2004: surgery (n = 311), general medicine (n = 251), elderly care (n = 184), orthopaedics (n = 151), urology (n = 61), and three other specialties (n = 68).

Main outcome measures Proportion of admissions with at least one patient safety incident; proportion and type of patient safety incidents missed by routine incident reporting and case note review methods.

Results 324 patient safety incidents were identified in 290/1006 admissions (28.9%; 95% confidence interval 25.3% to 32.5%). 270 (83%) patient safety incidents were identified by case note review only, 21 (7%) by the routine reporting system only, and 33 (10%) by both methods. 110 admissions (10.9%; 9.0% to 12.8%) had at least one patient safety incident resulting in patient harm, all of which were detected by the case note review method.

Conclusion The routine incident reporting system may be poor at identifying patient safety incidents, particularly those resulting in harm. Structured case note review may have a useful role in surveillance of routine incident reporting and associated quality improvement programmes.

Incident reporting only detects 5% of harmful events
Is health care getting safer?

Despite numerous initiatives to improve patient safety, we have little idea whether they have worked. Charles Vincent and colleagues argue that we need to develop systematic measures.

We do not know whether we are making progress or not.
Safety interventions

The challenge of scaling up and knowing what has happened afterwards
Cumulative incidence radiologically confirmed thrombosis

Kreckler et al, 2010
Major successes in focal clinical areas

Operating theatre

- Major complication rate decreased 36%
- Mortality decreased 47%
- Post-op infection decreased 48%

Intensive care

- Central line infection rates decreased 66%
- Quarterly infection rate in most ICU’s <1%
- Estimated saving of $175 million
- Potentially more than 1500 lives saved
Safer Patients Initiative
To reduce adverse events by 50% in 24 hospitals

Programme model

Change elements

Process measurement

Expert support

QI methodology

Safer Patients Initiative
Participating hospital site

The Health Foundation
Commentaries on patient safety in the United States five years after the publication of two key reports on patient safety in 2000 were characterised by some despair at an apparent lack of progress. Our data suggest that a more encouraging story on patient safety in the NHS can now be told.

Benning et al, 2011
The Achievements of SPI

- Inspirational and important legacy
- Objectives over ambitious
- Organisations in different states of readiness
- First major UK safety initiative that took evaluation seriously
- Simply getting basic clinical data and measures was a major challenge
Assessing safety interventions at population level
Temporal trends in rates of patient harm: United States

**Figure 2.** Rates of All Harms, Preventable Harms, and High-Severity Harms per 1000 Patient-Days, Identified by Internal and External Reviewers, According to Year.
Partnership for Patients hospitals tout quality improvements but critics see a lost opportunity

By Maureen McKinney
Posted: May 3, 2014 - 12:01 am ET
Tags: Healthcare Reform, Quality, Safety

When HHS unveiled its Partnership for Patients initiative in 2011, its $1 billion budget and ambitious improvement targets signaled to many in healthcare that the patient-safety movement was finally being recognized with a sweeping and long overdue national program. More than 3,700 hospitals signed...
Did Hospital Engagement Networks Actually Improve Care?

- ‘Weak study design and methods, combined with a lack of transparency and rigour in evaluation …’
- ‘These numbers appear impressive but given the publicly available data and the approach CMS used it’s nearly impossible to tell whether the PPP actually led to better care’

(Pronovost & Jha, NEJM 2014)
Aspiration and realism. The pace of change?
Measurement & Evaluation

- Our major challenge will be to demonstrate change (rather than activity)
- This has bedevilled all safety programmes in NHS
- **Measurement is therefore number 1 priority because:**
  - It focuses minds and priorities
  - It has been the major headache for all safety programmes
  - The time taken to get measures in place has been consistently underestimated
  - It is essential for the programme teams to function effectively
  - It is fundamental to evaluation

Vincent 2014, Patient Safety Collaborative Launch
• Results have been shared with regional trusts, CCGs and national stakeholders.
• The work has attracted interest from other AHSNs, the Sepsis Trust UK & NHS England.
Suspicion of sepsis
Mortality for Oxford AHSN region

<table>
<thead>
<tr>
<th>Year</th>
<th>Trust A</th>
<th>Trust B</th>
<th>Trust C</th>
<th>Trust D</th>
<th>Trust E</th>
<th>Trust F</th>
<th>Trust G</th>
<th>Trust H</th>
<th>National average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-13</td>
<td>7.2%</td>
<td>7.2%</td>
<td>4.5%</td>
<td>7.7%</td>
<td>6.3%</td>
<td>7.1%</td>
<td>5.6%</td>
<td>9.0%</td>
<td>7.1%</td>
</tr>
<tr>
<td>2013-14</td>
<td>6.8%</td>
<td>7.1%</td>
<td>4.9%</td>
<td>7.7%</td>
<td>5.9%</td>
<td>6.0%</td>
<td>5.5%</td>
<td>7.5%</td>
<td>6.7%</td>
</tr>
<tr>
<td>2014-15</td>
<td>7.0%</td>
<td>6.6%</td>
<td>5.3%</td>
<td>6.7%</td>
<td>6.5%</td>
<td>7.1%</td>
<td>5.5%</td>
<td>6.9%</td>
<td>6.8%</td>
</tr>
<tr>
<td>2015-16</td>
<td>6.2%</td>
<td>5.8%</td>
<td>5.6%</td>
<td>6.6%</td>
<td>0.0%</td>
<td>5.8%</td>
<td>5.2%</td>
<td>6.5%</td>
<td>6.4%</td>
</tr>
<tr>
<td>2016-17</td>
<td>5.1%</td>
<td>4.8%</td>
<td>4.9%</td>
<td>6.2%</td>
<td>0.0%</td>
<td>5.4%</td>
<td>4.5%</td>
<td>6.4%</td>
<td>6.0%</td>
</tr>
</tbody>
</table>
Proposal for a Central Measurement Unit

To form a small, dedicated safety measurement unit to support the national collaborative programme both nationally and at local level by providing safety information to each AHSN. This is potentially extremely cost effective as there would be considerable savings at the level of each AHSN.

Proposal for a Central Measurement Unit

The aims of the unit would be:

- To monitor safety across England in respect of the work streams developed within the collaborative programme and the Sign up to Safety Campaign
- To provide safety information to all AHSNs to use in the design and monitoring of improvement programmes
- To provide advice and technical support to the national programme board and to individual AHSNs
- In time to develop a wider suite of safety measures to increase understanding of the mechanisms, influences and impact of the collaborative programme
Proposal for a Central Measurement Unit

In the short term (within first year) the PSCMU needs to:

- Provide a core suite of outcome measures that all AHSNs can draw on
- AHSNs would be free to use these but not forced to
- All measures in this stage would be from available national data and registries.
- The unit would assess reliability and validity for each measure and act as a methodological resource and guarantor
- All AHSNs would use their own local process and PDSA measures in whatever way they wished - but often with high level national measures in mind
Scope of the Patient Safety Measurement Unit (2017)

- Bring together existing safety information and improve analysis and insight from existing sources information
- Complement and support local analytics within Patient Safety Collaboratives through providing expertise and access to data
- Develop the evidence base for safety improvement programmes
  - Nationally
  - Local delivery of national programmes
  - Local delivery of local programmes
- Develop the longer term vision and work collaboratively to address gaps in safety measurement
Scope of the Patient Safety Measurement Unit

• Bring together existing safety information and improve analysis and insight from existing sources information

• Complement and support local analytics within Patient Safety Collaboratives through providing expertise and access to data

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  – Local delivery of national programmes
  – Local delivery of local programmes

• Develop the longer term vision and work collaboratively to address gaps in safety measurement
National patient safety workstreams

- Safety culture
- Deterioration, including Sepsis and AKI
- Maternity and neonatal
Example 1: deterioration in hospital

How can the Patient Safety Measurement Unit support PSCs to measure progress with interventions to improve identification and treatment of deteriorating patients?

- What information is already available, and what could be measured now?
- What are the gaps and what are the challenges with the current measures?
- Where are there opportunities to address measurement gaps?
- What unmet need remains?
Interventions to improve care of acutely ill patients

Screening to identify higher risk patients

Patient in a ward ➔ Assessment ➔ Deterioration recognised ➔ Treatment

Rapid access to help

Monitoring to identify deterioration and underlying causes earlier

Effective clinical interventions

What would we want to know about deterioration in hospital?

- How many patient’s are at risk of deterioration in hospital? Can sub-groups of patients at particular risk be identified?
- How many patients received relevant interventions in a timely way?
- Can we estimate high risk patients where the need for an intervention was avoided?
- What was the outcome for patients who did/did not receive the relevant intervention?
- What was the cost to the service in terms of wider resources?
- Do activities, outcomes, and costs differ from a comparison group?
<table>
<thead>
<tr>
<th>Area</th>
<th>Measures</th>
<th>Data sources</th>
<th>Caveats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients at risk</td>
<td>• Admissions to hospital, patients in hospital on a given day: stratified by age, sex, admission route, diagnosis</td>
<td>• Hospital PAS • National secondary uses data (SUS or HES)</td>
<td>• Acuity of patient not captured routinely – only proxy measures available • Diagnosis only coded after discharge – coding variable</td>
</tr>
<tr>
<td>Process</td>
<td>• Number of patients receiving intervention, eg % monitored at recommended intervals, % receiving treatment, admission to critical care etc.</td>
<td>• Local audit of notes or clinical record</td>
<td>• No routine data source across providers • Confounding between monitoring intervention and delivering intervention</td>
</tr>
<tr>
<td>Outcome</td>
<td>• Patients with condition indicating deterioration, eg sepsis, AKI • Mortality • Incidents of deterioration reported</td>
<td>• Hospital PAS • SUS or HES • Incident reporting system</td>
<td>• Raised awareness of deterioration likely to increase coding and incident reporting across these systems</td>
</tr>
<tr>
<td>Balancing</td>
<td>• Coding depth</td>
<td>• Hospital PAS • SUS or HES</td>
<td>• Variability in ‘standard’ coding sets</td>
</tr>
<tr>
<td>Cost</td>
<td>• Length of stay on ward • Stay in critical care</td>
<td>• Hospital PAS • SUS or HES • Unit costs</td>
<td>• Not sensitive to variation in skill mix, or other costs impacting on outcome</td>
</tr>
</tbody>
</table>
Example: Sepsis mortality and admissions, trend over time

Source: SUS data
Admissions and mortality, Kent, Surrey and Sussex CCGs, for sepsis related diagnoses
Measurement opportunities

- Wider discussion and standardisation of operational definitions for ‘wicked’ metrics
- Consistency in recording (e.g. agreed standards for clinical coding and recording)
- Audit tools linked to guidelines
- Improved recording and data collection tools
- Feedback and visualisation
Example 2: maternity and neonatal patient safety

How could the Patient Safety Measurement Unit support local maternity systems to understand and monitor safety?
Patient safety measurement framework

Past harm
Has patient care been safe in the past?

Integration and learning
Are we responding and improving?

Safety measurement and monitoring

Reliability
Are our clinical systems and processes reliable?

Anticipation and preparedness
Will care be safe in the future?

Sensitivity to operations
Is care safe today?

Vincent C, Burnett S, Carthey J, The measurement and monitoring of safety, Health Foundation, 2013
## Measurement for maternity and neonatal patient safety

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Example measures</th>
<th>Caveats</th>
</tr>
</thead>
</table>
| Past harm                   | • Poor outcomes, eg low birth weight, maternal smoking, still births and maternal and neonatal deaths  
                               • Incidents, clinical negligence claims | • Recording and coding practice changes as awareness increases  
                               • Underlying variation in risk linked to social, demographic and ethnicity factors |
| Reliability                 | • Access to antenatal care, identification of high risk pregnancies  
                               • Adherence to clinical guidelines during pregnancy, labour and after delivery | • Variation in recording and reporting of data along the clinical pathway  
                               • Reliability of routine/audit data |
Example: maternity dashboard

Maternity Services Overview November 2014 to October 2015

4,884 Women gave birth between November 2014 and October 2015

Giving Birth at Dartford and Gravesham NHS Trust

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>57 in every 100 women gave birth normally</td>
<td>57%</td>
</tr>
<tr>
<td>17 in every 100 women gave birth after an emergency caesarean section</td>
<td>17%</td>
</tr>
<tr>
<td>14 in every 100 women gave birth after a planned caesarean section</td>
<td>14%</td>
</tr>
<tr>
<td>12 in every 100 women gave birth assisted by a forceps or ventouse procedure</td>
<td>12%</td>
</tr>
</tbody>
</table>

Safety and Quality of your care at

97% of people who responded to the FFT survey between May 2014 and July 2016 would recommend maternity services at Dartford and Gravesham to friends or family that require similar care.

The Friends and Family Test (FFT) is an important feedback tool that supports the fundamental principle that people who use NHS services should have the opportunity to provide feedback on their experience. It asks people if they would recommend the services they have used and offers a range of responses. When combined with supplementary follow-up questions, the FFT provides a mechanism to highlight both good and poor patient experience.

Written Complaints

20 complaints were received about maternity services at Dartford and Gravesham between April 2014 and March 2015.

The Complaints Data comes from the NHS Complaints statistical publication (KCM). The NHS complaints procedure is the statutory based mechanism for dealing with complaints about NHS care and treatment, and all NHS organisations in England are required to operate the procedure. This annual collection is a count of written complaints made by or on behalf of patients.

Episiotomies rate for instrument delivery

<table>
<thead>
<tr>
<th>Rate</th>
<th>October 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>60.76%</td>
<td>Oct 15</td>
</tr>
</tbody>
</table>

General anaesthesia for caesarean section (emergency and elective)

<table>
<thead>
<tr>
<th>Rate</th>
<th>October 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.38%</td>
<td>Oct 15</td>
</tr>
</tbody>
</table>

3rd/4th degree tear rate with assisted deliveries

<table>
<thead>
<tr>
<th>Rate</th>
<th>October 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.80%</td>
<td>Oct 15</td>
</tr>
</tbody>
</table>

3rd/4th degree tear rate with unassisted deliveries

<table>
<thead>
<tr>
<th>Rate</th>
<th>October 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.31%</td>
<td>Oct 15</td>
</tr>
</tbody>
</table>
Thank you!

Any questions?