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ORIGINAL ARTICLE

Structured Feedback: Acceptability and Feasibility of a Strategy to Enhance the Role of a Clinical Quality Registry to Drive Change in Cardiac Surgical Practice

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Background The Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) Database collects and monitors preoperative, operative, and 30-day outcome data on patients undergoing cardiac surgery, and delivers regular performance feedback reports to key personnel with intent to drive quality improvement. The current feedback approach appears to be ineffective in driving change to minimise Unit performance variation. We sought to determine the acceptability and feasibility of providing structured feedback in addition.

Methods Cardiac surgeons were surveyed to assess their evaluation of the current feedback reports and assist in developing the content of structured feedback. We then assessed acceptability and performance outcomes of control Units receiving current feedback reports via email, versus intervention Units that in addition received structured feedback.

Results Survey respondents assessing the current feedback report agreed that the content is relevant (95%), key performance indicators (KPIs) are useful (85%), and that it would be beneficial to compare surgeons' KPIs (75%). Survey respondents rating method of feedback, requested structured feedback sessions one to two times annually (67%; control Units), and future structured feedback (83%; intervention Units). With combined report and structured feedback, improved performance was noted for an under-performing Unit. Limitations of feedback in driving quality improvement was high performance of Units at baseline, low surgeon participation, and scheduling challenges for structured feedback.

Conclusions In this pilot study, compared to the control method, structured feedback did not significantly improve communication. To maximise quality improvement efforts, a collaborative feedback approach that fosters a climate of continuous performance improvement, is recommended.

Keywords Registries • Feedback • Cardiac surgery • Patient outcomes • Quality improvement • Quality of care

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Introduction

Postoperative complications arising from cardiac surgery affect the patient's path to recovery and their quality of life. Variations in the rates of postoperative complications between surgical Units and individual surgeons are attributable to the patient's preoperative level of risk, surgeon-related factors, and hospital and health care system factors. The Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) National Cardiac Surgery Database Program aims to reduce variation in clinical performance, and to improve patient outcomes following surgery, by providing feedback on key performance indicators (KPIs) through comparison to other participating Units.

A review by the International Consortium for Health Outcomes Measurement (ICHOM), of the performance of the ANZSCTS Database Program against other cardiac registries, revealed that performance was favourable on four of the five domains (Figure 1), with opportunities for improvement in the fifth domain of driving change. A key component of driving change is providing meaningful, translatable, and timely performance feedback.

Performance feedback has been demonstrated to improve clinical practices including guideline adherence, clinical productivity, quality of care, and cost savings. Weekly presentation of adherence data to surgeons and providers was shown to improve blood utilisation in cardiac surgery, which was further improved when individual surgeon's behaviour was identified [1]. Clinical productivity of physicians, as measured by relative value units, significantly improved upon initiation of a monthly one-page feedback report summarising performance and financial data [2]. Monitoring, coupled with quarterly comparative performance feedback, in which Heads of Units were accountable for outlying performance from pre-set thresholds, significantly reduced transfusion of blood products and transfusion-related costs within a year of implementation [3].

Physicians consider monitoring quality and providing feedback to be of value, because it leads to improved medical care [4,5]. The impact of feedback is dependent on the method of delivery. Interviews of clinical and administrative hospital staff among Units with varied adherence to guidelines for β-blocker administration after acute myocardial infarction, highlighted seven common themes that made data feedback effective in the hospital setting (Figure 2; [6]). Similar thematic observations were reported by health professionals from 11 hospitals that successfully reduced door-to-balloon time. Data feedback was considered integral to improvement efforts. The key aspects of effective feedback were data validity, presentation by a credible clinician and in a format readily understandable so as to direct change in processes [7].

In this pilot study, we sought to evaluate access to, and value of, the current feedback reports provided to ANZSCTS Database surgeons, then develop and test the acceptability and feasibility of implementing structured feedback as a means to encourage a culture of performance excellence, with the aim to maintain high performance standards.

ICHOM

Category scores

	AUS score[1]	Avg. of all registries	Avg. of coronary reg.'s
Designing measures	3.8	3.9	3.8
Collecting Data	4.0	3.9	3.5
Analysing and reporting	3.8	3.7	4.0
Driving change	2.3	2.7	3.0
Governance and control	4.3	3.7	4.3

Figure 1 Performance review of the ANZSCTS Database. Performance of ANZSCTS Database is generally aligned with other cardiac registries, with a recommendation to improve on driving change in clinical practice *(Courtesy: Boston Consulting 2013 – unpublished)*.

Material and Methods

To assess surgeons' view of the current feedback reports and develop the content of structured feedback, an online survey was distributed to surgeons (n = 159) contributing to the ANZSCTS Database. Over a 6-week period, five reminder emails were sent to encourage completion of the survey. The current feedback report includes a review of variation between Units in 12 KPIs: mortality in hospital or within 30-days after discharge, cerebrovascular complication, permanent stroke, deep sternal wound infection (DSWI), intubation time, total length of stay (LOS), post-procedure length of stay (PPLOS), new renal failure

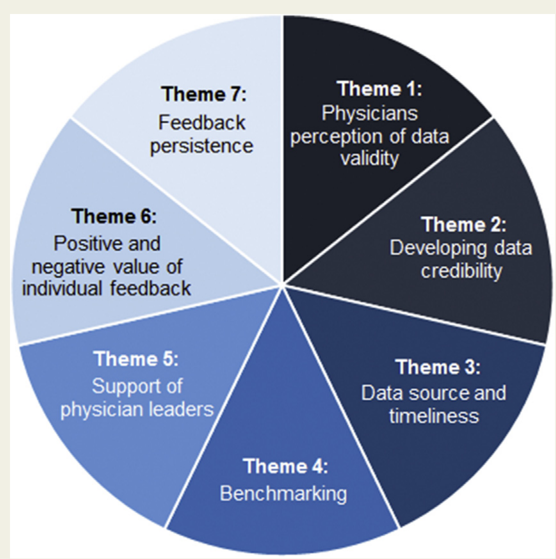

Figure 2 Themes for effective feedback. Seven (7) common themes for making data feedback effective in the hospital setting, adapted from Bradley et al. (2004).

(NRF), red blood cell (RBC) and non-RBC usage, and return to theatre for bleeding, all compared to national averages.

To evaluate the effectiveness of the current feedback report versus structured feedback, four Victorian Units contributing to the ANZCSTS Database were invited to participate in the study. Control Units (n = 2) received the current feedback reports, distributed each quarter via email to the Head of Unit and Data Manager. Intervention Units (n = 2), in addition, received face-to-face structured feedback, delivered by an external surgeon at the Unit's quarterly multi-disciplinary surgical review meeting.

Structured feedback was customised to show KPIs specific to the Unit, highlighting areas of excellence as well as underperformance. Performance of the Unit was compared to national performance. An open discussion focussed on any variation in performance and outcome, followed the presentation, providing opportunities to discuss areas that may require improvement, and openly discuss ideas, suggestions, and advice on feedback. Intervention Units were visited, following the completion of the quarterly review of data by the ANZSCTS Database Steering Committee.

Unit participants in both control and intervention groups received a short online survey to rate reporting content, format, and value of their Unit's assigned feedback method. Approval for this study was obtained from the Monash University Human Research Ethics Committee, project number CF15/577-2015000264.

Results

Determining Criteria for Reporting

Twenty-four (24) (15%) surgeons responded to the initial survey; 22 of whom indicated they were practicing at Units contributing to ANZCSTS Database. The 22 respondents represent 65% of contributing Units.

Of the 22 surgeons from contributing Units, 17 received the current feedback reports from the Head of Unit (18%), Data Manager (32%), or Data Management Centre (27%). Respondents who did not receive the report, stated that they were unsure why, that their Unit Mortality and Morbidity meetings were disorganised, and one respondent further commented that the current feedback report should be distributed to all contributing surgeons rather than be distributed at the discretion of the Head of Unit.

Two (2) respondents were excluded from further analysis due to no further questions being answered. Therefore, data was compiled from 20 completed responses.

The application of the current feedback reports (Table 1) was affirmed primarily for Mortality and Morbidity meetings (50%), audits (55%), and for quality assurance purposes (90%). The use of the current feedback reports in Unit and hospital-wide meetings, was rated lower as 45% and 35% respectively. Sixty-five (65) per cent of respondents agreed that the current feedback reports helped inform individual practices, and 40% provided specific examples of actions resulting from report reviews with the general theme being the conduct of internal reviews of clinical practices when an indicator outcome was shown to be an outlier in comparison to other Units.

In assessing the general content of the current feedback report (Figure 3), the majority agreed to all statements. The report content was clear for performance (85%); relevant to surgeons and Units (95%); addresses issues relevant to hospital administration (65%); and provides relevant information about patient risk factors and outcomes for both isolated (70%) and non-isolated (75%) coronary artery bypass grafting (CABG) procedures. Control charts were viewed as useful (90%), and inclusion of comparative surgeon KPIs beneficial (75%).

On assessment of KPIs reported in the current feedback reports (Figure 4A), only three KPIs were considered not useful by a small number of respondents. These were intubation time (25%), LOS (15%), and PPLOS (10%). Other reported KPIs were considered by the majority to be either somewhat useful or useful, with the KPIs ranked as most useful being 30-day mortality (85%), and 30-day in-hospital mortality, reoperation for bleeding, and DSWI at 30 days (all 75%).

Of five suggested additional KPIs, four were favoured by greater than 50% of respondents (Figure 4B).

Evaluation of Structured Feedback by Control and Intervention Groups

Control and intervention groups each included one private and one public Unit. The four Units report on average 108-188 cases per quarter, have 7-14 primary operating surgeons and based on year 2014 data, show similar performance in all

Table 1 Results of survey of surgeon assessment of application of current feedback reports by their unit.

	Yes n (%)	No n (%)	Missing n (%)
Mortality and morbidity meetings	10 (50)	10 (50)	0 (0)
Unit meetings	9 (45)	11 (55)	0 (0)
Audits	11 (55)	8 (40)	1 (5)
Hospital wide meetings/audits	7 (35)	11 (55)	2 (10)
Used for quality assurance purposes	18 (90)	2 (10)	0 (0)
Helped inform individual practices	13 (65)	6 (30)	1 (5)
Actions resulting from feedback reports	8 (40)	n/a	n/a

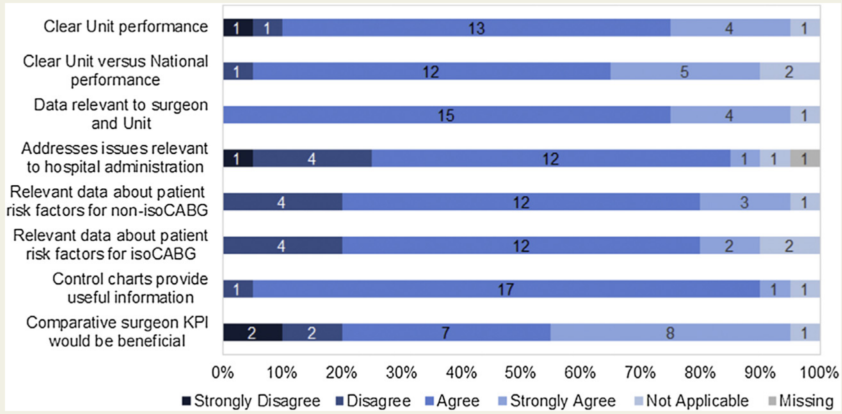

Figure 3 Surgeon assessment of current feedback reports. Content of current feedback reports were viewed favourably with a majority of respondents considering the report clear, useful, and relevant, and agree to the benefit of comparing surgeons' KPIs.

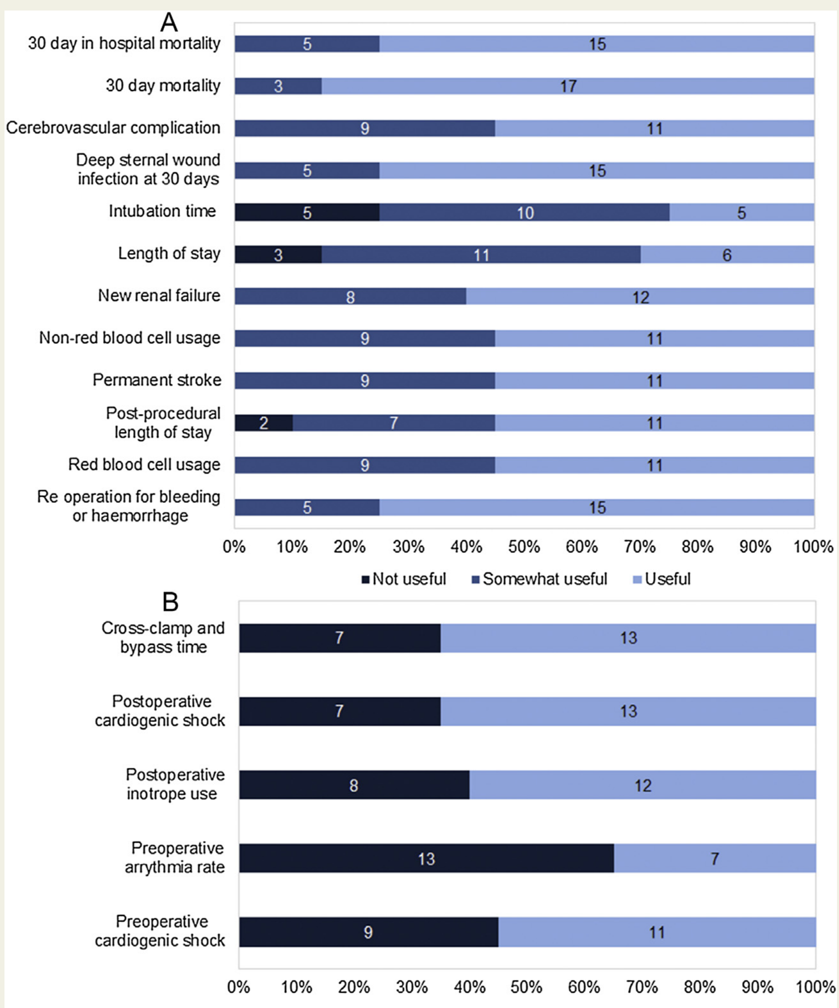

Figure 4 Surgeon assessment of the value of reported and suggested KPIs. A. Currently reported key KPIs. Each of 12 KPIs reported by ANZSCTS Database were considered somewhat useful or useful by >75% of respondents; B. Suggested new KPIs. Inclusion of four of the five additional KPIs was favoured.

KPIs except derived NRF, in which one Intervention Unit was an outlier from the national average.

For control Units, current feedback reports were sent to the Head of Unit and Data Manager in a routine manner during the study period. Twenty-one (21) surgeons were listed as primarily practising at the control Units. Six (6) surgeons completed an online survey to assess current feedback report content, value and method. The results were favourable (Figure 5A). Of the six surgeons, only four received the current feedback reports; two from the Head of Unit (33%), one from the Data Manager (17%), and two from the Data Management Centre (33%; one surgeon indicated receipt from both Data Manager and Data Management Centre). The survey respondents found the content relevant, easy to understand, and useful (83%); and welcomed feedback on their own performance (67%), additional surgeon data (50%), and data presented as a percentage of caseload (67%). A high proportion (83%) of respondents agreed the data will be used for quality assurance, while only 50% agreed the data may be used to inform clinical practice. A majority (67%) welcomed structured feedback sessions one to two times annually, 67% also indicated that they would likely attend a structured feedback session. The majority of participants reported that medical professionals, not limited to cardiac surgeons, should attend the structured feedback sessions.

For Intervention Units, two structured feedback sessions were held over a 12-month period. These sessions were designed to be open to the multidisciplinary cardiac surgical team. Attendance for session 1 and 2 respectively was three and four of seven surgeons for Unit 1, and three and five of 11 for Unit 2. Nurses attended sessions for one Unit, however no feedback survey was completed. Each session was customised to the Unit, and included a review of any outlying KPIs as well as KPIs thought to be of particular interest as determined by the presenter. All attendees of session 1, and two of nine from session 2, completed a survey rating the structured feedback session. Survey results from session 1 revealed participants found the content of the presentation relevant, easy to understand, and useful (100%); desired data to be presented as a percentage of caseload (100%); and agreed the data will be used for quality assurance (100%) and to inform clinical practice (67%; Figure 5B). Future structured feedback sessions were welcomed by 83% of survey respondents. However 50% of participants felt there should be more feedback on their own performance, and for surgeon and Unit data. Given the low number of responses to session 2, these are not presented graphically. The two respondents agreed structured feedback sessions are useful and informative, desired inclusions of additional KPI comparisons, and indicated that written reports would be of less value.

Effect of Feedback on Clinical Practice

Control and intervention Units were high-performing at baseline, with similar performance during 2014 in 11 of 12 reported KPIs. The exception was derived NRF, in which one intervention Unit was an outlier from the National average. Outlier performance was notified to the Head of Unit by distribution of the current feedback report as per current Database policy.

The relatively high incidence of derived NRF was highlighted in the first structured feedback session for this Unit. Routine feedback continued, with a consequent decline in the incidence of derived NRF for the outlier Unit, reaching below the national average by the second structured feedback session, scheduled 10 months after the first (Figure 6). In the open discussion following that presentation, the Head of Unit noted that an internal review was conducted, partially attributed to notification by the Data Management Centre and partially to the Unit's internal audits, leading to implementation of a new practice protocol that resulted in a decline of NRF rates.

Discussion

Monitoring performance and providing informative feedback are essential processes in clinical quality management. Performance feedback has been shown to change clinical practices resulting in improved productivity and patient quality of life [2,3]. The ANZSCTS Database is a National initiative aimed at ensuring that high standards are maintained in all Units undertaking cardiac surgery in Australia. Despite the Program's provision of regular feedback reports to contributing Units, significant variation in Unit performance persists, which may reflect a lack of Unit engagement in information sharing and quality improvement. Therefore, the aim for this pilot study was to assess the acceptability and feasibility of implementing structured feedback to Units, as an additional potentially more effective feedback method to drive change in clinical practice to maintain high standards of service.

Notwithstanding multiple reminders, only 15% of surgeons registered as contributing to ANZSCTS Database responded to a survey assessing the value of the Program's current feedback reports. The low response rate may suggest that many surgeons do not view the feedback reports as informative or relevant to their own practice, or it may reflect the on-line survey methodology not being effective in this surgeon cohort. On a positive note, the respondents did represent 65% of contributing Units, with the majority agreeing that current feedback reports are of value, and welcomed structured feedback sessions. The low survey response rate may also be attributable to surgeons being unaware of the information provided by ANZSCTS Database. This is observed in the survey results from the Control Units, where of six surgeons who completed the survey, only four received the reports; two from the Head of Unit, one from the Data Manager, and one from both Data Manager and the Data Management Centre. As governed by the Steering Committee, the Data Management Centre provides the quarterly reports to the Heads of Units, and Data Manager, for further dissemination to the Unit's multidisciplinary surgical team at the discretion of the Head of Unit. This process could be

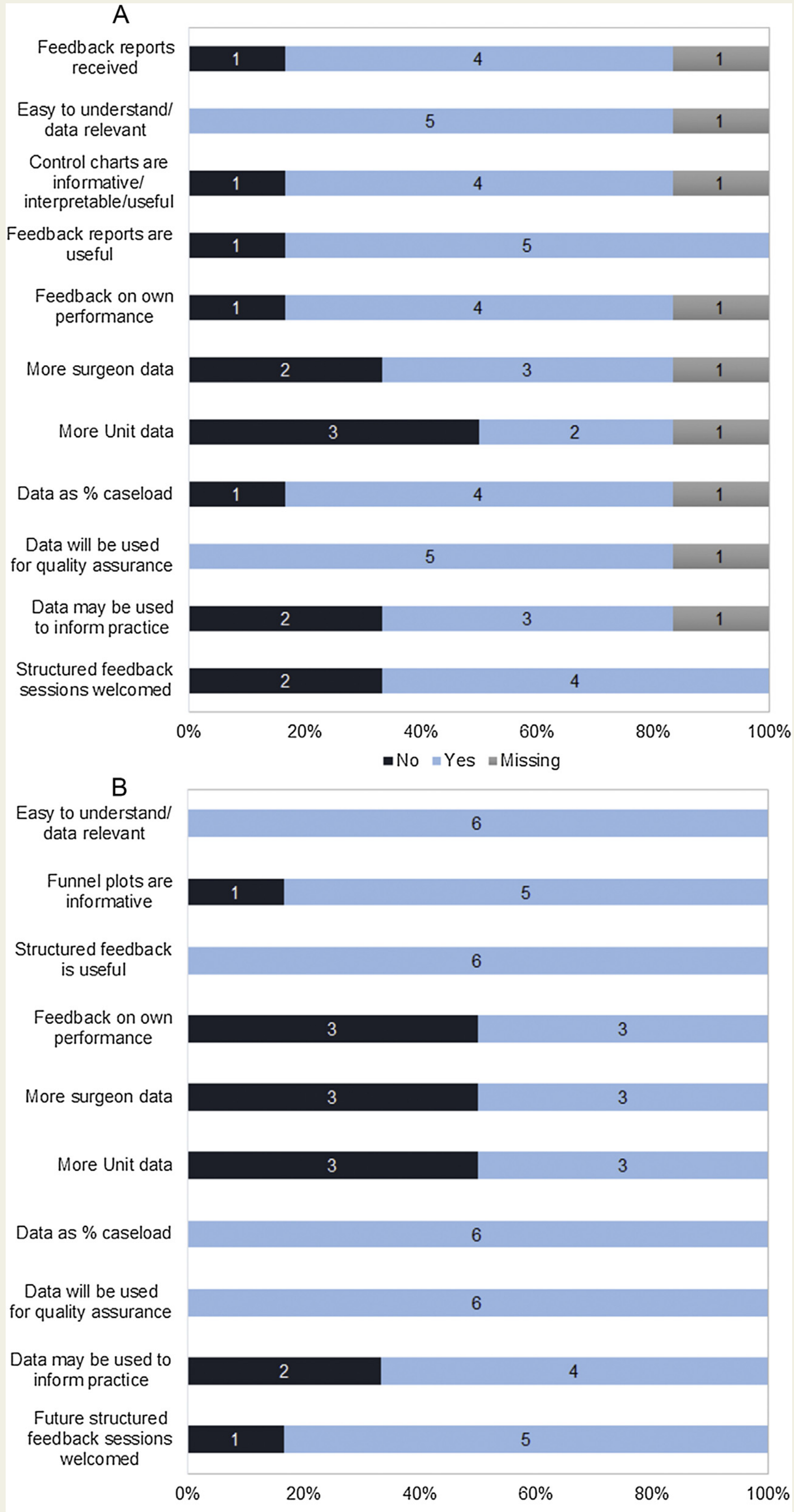

Figure 5 Surgeon assessment of control and intervention feedback methods. Positive responses were received from both control (A) and intervention (B) Unit participants. Feedback reporting was considered relevant, and useful for quality assurance, more data and structured feedback sessions were welcomed.

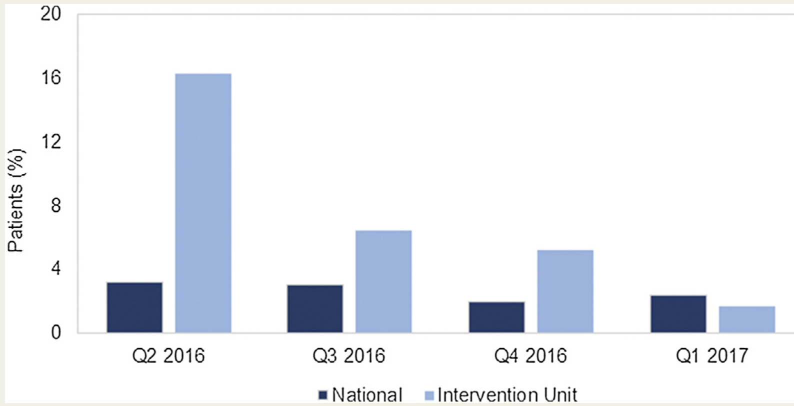

Figure 6 Outlier performance improved between structured feedback sessions. Dual feedback reporting methods led to Unit internal review and change in practice that resulted in an improvement in outcome measure for an identified outlying KPI.

improved by expanding the quarterly report distribution list to include all participating surgeons within the Unit.

The four Units in the study were chosen primarily because the Head of Unit was known to encourage and provide direction for quality improvement — factors essential to motivating surgeon participation [7,8]. Nevertheless, surgeon attendance at structured feedback sessions was low, ranging from 27 to 57%. Low participation may be due to surgeons perceiving little value in feedback especially when their Unit is identified as high-performing, perceived threat of identifying poor performance, relative resistance for self-improvement, or doubt that such data can influence process change in complex hospital systems. Greater interest may be generated if representatives from consistently high-performing Units highlighted effective processes used in their Unit to improve patient outcomes, if individual surgeon performance was presented as a means for knowledge sharing and performance improvement, and if examples where feedback led to process change were shared.

Given the low surgeon participation rate, staff resources required to provide structured feedback is an important consideration. The time required to analyse and prepare structured feedback was 10 hours per Unit for each session, in addition to the 16 hours required to prepare and provide current feedback reports to 30 participating sites each quarter. Scheduling structured feedback sessions was a challenge, with multiple cancellations due to unavailability of surgeons, Head of Unit or presenter, or an alteration in the Unit's multidisciplinary meeting program. This further highlights the difficulty of introducing a structured feedback program in clinical units where there may already be a perception of high performance, of limited time availability for quality processes and where the value placed on the information received by ANZSCTS Database may still need to be demonstrated. Taking into account the low participation by Unit personnel and the significant additional staff resources required, the overall feasibility of implementing structured feedback, even if limited to when underperformance is noted, is low in the absence of a Unit culture that encourages continuous improvement. The ANZSCTS Database will continue to liaise with surgical units on the development of a performance monitoring culture that engages with structured feedback as a mechanism to improve clinical outcomes for patients.

Public reporting of performance measures, and implementation of a merit system for Units consistently exceeding defined achievable national quality targets, may motivate organisations to set the highest goals to improve care. However, given the process of patient care is multifaceted and influenced by caseload and patient risk profile, and as effects from change processes are unlikely to be observed immediately, clinical impact on patient care upon improvement on a specific KPI, is likely minor. Nevertheless, best practice guidelines may be identified from organisational culture, structure, and processes in consistently high-performing Units, and adapted where feasible, by low-performing Units.

Participating Units in our study were high-performing on most KPIs. One Unit in the intervention arm was shown to be an outlier from National averages on a single KPI on commencement of the study. Through notification, and routine quarterly reporting and structured feedback, combined with internal review and audit, the Unit implemented change to improve their performance on the outlying KPI. An improvement was demonstrated between the two structured feedback sessions, held 10 months apart. This demonstrates the value of frequent and timely current performance feedback. Others have shown that, compared to standard feedback reports, targeted multimodal feedback through reports, person-to-person delivery and webinars, has marginal improvement on performance. The effectiveness has been postulated to be dependent on baseline performance, provision of actionable information, how the feedback is utilised by the organisation and the organisational attitude to continuous improvement [9–12]. For instance, a seven-item multimodal feedback process improved low internal mammary artery (IMA) use to a targeted state benchmark of 90% over 4 years, attributed to sharing practice patterns and appropriateness of IMA utilisation by clinical leaders [13].

The most effective means of quality improvement, as evidenced through high-performing Units with low acute myocardial infarction mortality rates, rests primarily with the organisation's engagement and culture to implement change through communication and coordination, learning and problem solving, and a shared vision of excellence [12]. Moreover, quality improvement requires involvement of multidisciplinary specialists in health care, which should be encouraged through dissemination of feedback reports to a wider audience including treatment and care staff, and hospital management and administrators. The perceived deficiency in engagement in quality improvement highlights an ongoing role for professional societies and colleges in promoting quality improvement training, and an understanding of the role of quality improvement within the clinical unit and organisation. Addressing this issue in advance of mandatory Government policy, to increase engagement in data collection, feedback reporting, and process change would be beneficial.

Limitations

The small number of units studied and the lack of variation in performance on KPI's limited the pilot study's ability to demonstrate any improvement in communication. The low surgeon participation, with less than 50% of attending surgeons participating in three of the four interactive sessions, and the lack of a multidisciplinary team involvement were the significant limitations of this pilot study. In-person interviews may be more effective to obtain surgeons' opinions. Evaluating acceptability of structured feedback in a larger Unit cohort may reveal differences in the effectiveness of structured feedback in high and low-performing Units, the motivation of surgeons to participate, and methods to promote organisational commitment to quality improvement.

Conclusion

In this pilot study, compared to the control method, direct feedback did not significantly improve communication. Clinical registries should continue to provide performance feedback to Units through benchmarked feedback reports disseminated via email, importantly increasing distribution to all contributing health professionals and key personnel. Additionally, registry staff should engage with Unit staff to promote and strategise a culture of continuing quality improvement, and with change leaders who are able to provide recommendations and direct achievable actions when required.

Disclosures

JS, GS, and RB are employed at hospitals that have cardiac surgical units that contribute to the ANZSCTS Database.

Acknowledgements

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