Implementing Sustainable Data Collection for a Cardiac Outcomes Registry in an Australian Public Hospital

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Background	Clinical outcome registries are an increasingly vital component of ensuring quality and safety of patient care. However, Australian hospitals rarely have additional resources or the capacity to fund the additional staff time to complete the task of data collection and entry. At the same time, registry funding models do not support staff for the collection of data at the site but are directed towards the central registry tasks of data reporting, managing and quality monitoring. The sustainability of a registry is contingent on building efficiencies into data management and collection.
Methods	We describe the methods used in a large Victorian public hospital to develop a sustainable data collection system for the Victorian Cardiac Outcomes Registry (VCOR), using existing staff and resources common to many public hospitals. We describe the features of the registry and the hospital specific strategies that allowed us to do this as part of our routine business of providing good quality cardiac care.
Results	All clinical staff involved in patient care were given some data collection task with the entry of these data embedded into the staff's daily workflow. A senior cardiology registrar was empowered to allocate data entry tasks to colleagues when data were found to be incomplete. The task of 30-day follow-up proved the most onerous part of data collection. Cath-lab nursing staff were allocated this role.
Conclusion	With hospital accreditation and funding models moving towards performance based quality indicators, collection of accurate and reliable information is crucial. Our experience demonstrates the successful implementation of clinical outcome registry data collection in a financially constrained public hospital environment utilising existing resources.
Keywords	Cardiac outcomes • Registry • Data Collection

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Introduction

Clinical outcome registries improve patient outcomes [1,2]. As a result, there is a major drive locally and globally to collect data that describes the quality of care provided to patients undergoing high-risk, high-cost and high-volume procedures such as cardiac interventions. The Australian Commission for Safety and Quality in Health Care have identified registries, such as a cardiac procedures registry as an important component of a quality of care plan for Australia hospitals [3]. However, Australian public hospitals rarely have additional resources or the capacity to fund the additional staff time to complete the task of data collection and entry. At the same time, registry funding models do not support staff for the collection of data at the site but are directed towards the central registry tasks of data reporting, managing and quality monitoring. The sustainability of a state based or national registry is contingent on building efficiencies into both a) the collection of data at the local level; and b) the monitoring and reporting of data back to sites in order to inform current practice.

Incomplete or poor quality data collection compromises the value of outcome registries [4] and strategies for maintaining quality data collection are a key component of sustainability. A ''business as usual'' approach to the collection of a minimum standard data set to adequately allow for the reporting of risk adjusted clinical and patient reported outcomes is the goal.

We describe the methods used in a large Victorian public hospital to develop a sustainable data collection system for the Victorian Cardiac Outcomes Registry (VCOR), using existing staff and resources common to many public hospitals. We describe the features of the registry and the hospital specific strategies that allowed us to do this as part of our routine business of providing good quality cardiac care.

The Victorian Cardiac Outcomes Registry

The Victorian Cardiac Outcomes Registry is a state-based clinical quality registry designed to monitor the performance of health services in Victoria in the delivery of high-cost cardiac-based therapies, including percutaneous coronary intervention (PCI). The data collection described in this paper is for the PCI module of VCOR. The Victorian Cardiac Outcomes Registry was established in 2012 through joint venture funding from the Victorian Department of Health and Medibank Private. The VCOR PCI module is engaged at all Victorian hospitals (13 public and 17 private). Five of the private hospitals have been recently engaged in late 2016 and will commence data collection in early 2017. The VCOR collects baseline demographic, procedural characteristics, in hospital outcome and 30-day outcome data on all patients who undergo PCI at a given facility. All current 25 hospitals collecting VCOR data have developed their own data collection methodology based on what local resources were available. No additional funding was made available by the VCOR to facilitate data collection.

To facilitate accurate and efficient data entry by all sites, the VCOR developed a secure web-based data collection system that allows data entry by multiple users on any computer within the health service. All data entry personnel are required to be registered with the VCOR, with appropriate security levels of access to the data tailored to match the roles of contributing staff members.

The data collected in the VCOR broadly correlates with a patient's progress through the hospital, from procedure through to discharge and follow-up. This allows staged collection of data in real time as the patient progresses through the hospital admission. Data can be entered and saved as they become available and multiple users are able to enter sequential data for any single patient. Completeness of data entry can be tracked and monitored on the online systems dashboard.

The data always remain the property of the submitting hospital, with the central VCOR office undertaking analyses and reporting. Authorised users at the health service are able to extract their site-specific data from the central registry for internal use at any time. These data can also be accessed online in the form of real time pre-defined reports covering a specified reporting period, and can be used to generate local monthly reports. In addition, full downloads of sites' raw data into the desired format, e.g. an Excel spreadsheet, can be performed at any time for quality assurance reviews or research projects (assuming local ethics approval is obtained).

Data integrity is ensured with regular audit activities conducted by the central registry. The principal output of the registry is in the form of quarterly site and annual reports, providing data on outcomes and comparative performance assessment (Figure 1).

Implementation of Sustainable Model of Data Collection for VCOR

Our site performs a minimum of 15 PCIs each week and we estimated that the task of data collection would take approximately 8 to 10 hours per week. However, there were no available resources to employ a dedicated data manager for data entry and follow-up. Nor was any additional funding made available to subsidise existing employees in this role. Instead, we successfully implemented a strategy of embedding data collection responsibilities into employees' existing roles.

As the data required for the VCOR tracks the progress of patients through their hospital admission, we mapped specific data elements for collection to particular health service clinical staff (Table 1). This process was based on the concept that the data hospital staff members were required to collect would be easily accessible to them as part of their normal employment duties in our department.
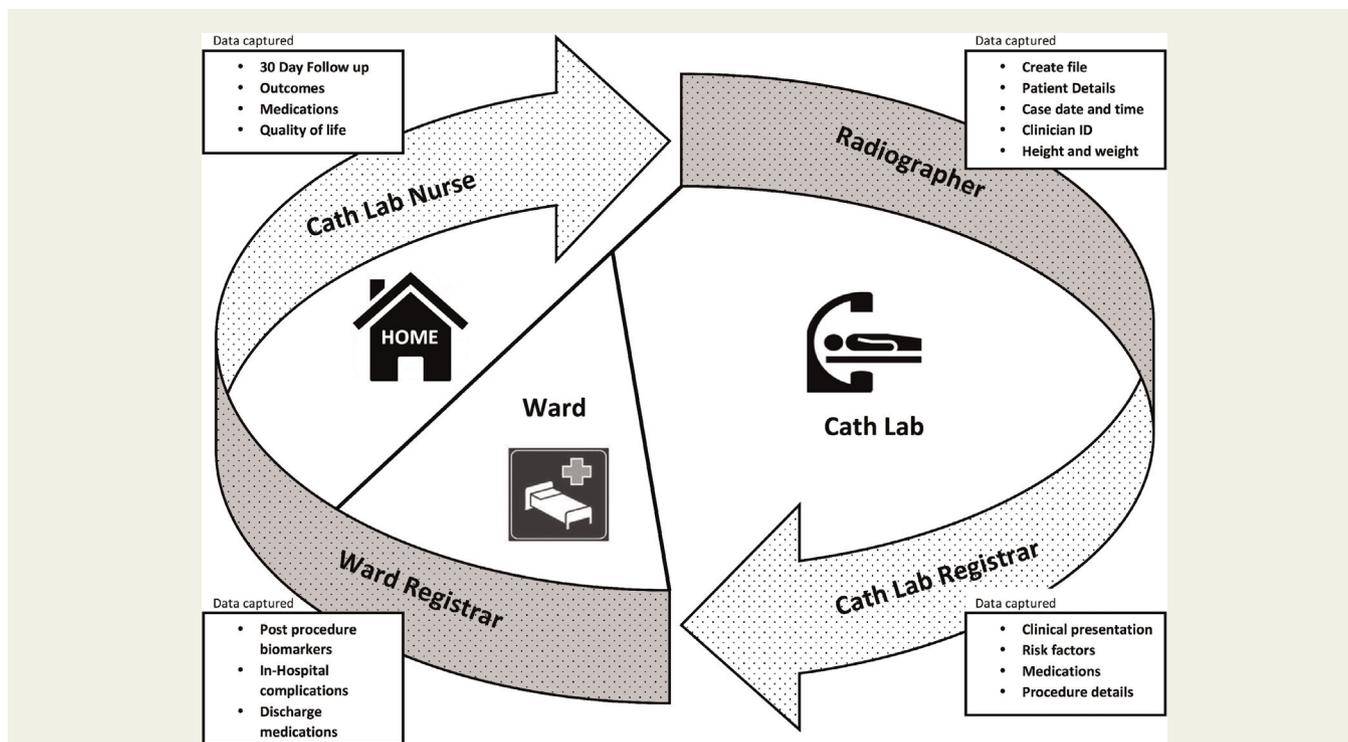
Figure 1 Embedded data collection model.

All clinical staff involved in patient care were given a data collection task with the entry of these data embedded into the staff's daily workflow. A senior cardiology registrar was empowered to allocate data entry tasks to colleagues when data were found to be incomplete. Oversight of the data collection process was allocated to a permanent non-clinical IT manager, whose duties extended to the registration of new staff and tracking complete data capture using the online systems dashboard. This person was not given any data entry role.

With this approach, we were able to achieve our goals of routine and efficient data collection without allocating additional funds for salary and wages. We purposely kept each individual's contribution to data collection small to minimise the imposition on staff members and foster compliance.

We ensured that Hospital Management was also engaged with the project with individual meetings with Chief Radiographer, Divisional Executive, Cath-lab Nurse Manager and Cardiology registrars to explain the project and address any potential concerns.

The task of 30-day follow-up proved the most onerous part of data collection. Patients are contacted via telephone, which can prove difficult where patients are of non-English

Table 1   Mapping collection of VCOR data elements to specific staff members and time points during hospital admission.[*,+]

Data element	Staff member responsible	Time and location of entry
Patient details	Radiographer	Cath-lab at commencement of PCI
Admission/procedure date and time, clinician	Radiographer	Cath-lab at commencement of PCI
Clinical presentation, risk factors, medications	Cath-lab registrar	Cath-lab after completing PCI report
Procedure details	Cath-lab registrar	Cath-lab after completing PCI report
Post-procedural biomarkers	Ward registrar	On ward on day of discharge
In hospital complications	Ward registrar	On ward on day of discharge
Discharge medications	Ward registrar	On ward on day of discharge
30-day follow-up–outcomes, medications, QoL	Cath-lab nurse	In cath-lab recovery (during normal working day)

Abbreviation: QoL, Quality of Life.

[*]Senior cardiology registrar allocates data entry tasks to colleagues when data incomplete.

[+]Non-clinical IT manager tracks data collection, completeness and provides login access to new staff.

speaking background, have an itinerant home address or have work commitments that make it difficult for them to find a time to take a phone call. Cath-lab nursing staff were allocated this role. Their engagement was achieved by prioritising VCOR follow-up above pre-existing data entry duties for a number of other databases that were being run in our department at the same time. While these older databases had been useful in the past, there were some lingering concerns about the quality of the collected data and the limited number of staff who had sufficient familiarity with these systems to utilise them appropriately. In the end, only collection of data pertaining to VCOR, other approved quality assurance activities or hospital-sanctioned research projects was allowed to continue. We did experience some push back from staff who were vested in the pre-existing databases. They cited concerns that abandonment of these datasets would compromise patient care. This was countered over time by demonstrating the superior data integrity, reliability and effective reporting and feedback functions provided by the VCOR dataset.

Nurses who managed the patients during their index stay were subsequently involved in their follow-up calls. This led to a system where nurses began routinely advising patients while they were still in recovery post-procedure to expect a follow-up call from the hospital at 30 days and confirmed the patients' best contact details. Dedicated computer and desk space was made available in the cath-lab recovery to facilitate these follow-up calls.

The VCOR audit activities include case ascertainment (assessing that all eligible cases are entered into the registry) and data quality assessment (accuracy of data as determined by review of source data). Audit results demonstrated a 97% compliance with key variables, encompassing those used for risk-adjustment and outcome reporting [5]. We believe the audit results over time support the accuracy and sustainability of this model.

Value Proposition of VCOR Data to Our Hospital

We appreciated that it was important for staff members to see and understand the value of their time commitment to the VCOR project and that this would assist in ensuring the long-term sustainability of the quality initiative. We therefore incorporated VCOR data into existing audit activities and provided staff with access to ongoing reports that, for the first time, benchmarked our hospital's performance against other institutions.

The VCOR data were included in monthly morbidity and mortality meetings. We routinely allocated 10 minutes of these meetings to a review of internal cath-lab procedure numbers, door-to-balloon times, adverse outcomes and trends—all extracted from the VCOR dataset for the previous month. Data completeness was also reported on and compared with previous months.

Externally prepared quarterly performance reports—produced by VCOR—benchmarked our outcomes against other (de-identified) hospitals. These data were presented at our own quarterly medical team meetings. Reports were also provided to hospital divisional and quality meetings. Additionally, a process was put in place through the hospital's quality division to forward VCOR annual reports to the hospital's peak quality governance group, the Chief Executive Officer and Hospital Board. Annual reports were also widely disseminated among cardiology unit staff.

Once external site audits by the VCOR established the integrity of the data, divisional key performance indicators (KPIs) were updated to match those from the VCOR. Specifically, door-to-balloon time replaced existing less meaningful unit KPIs for management of acute myocardial infarction. The VCOR dataset was also utilised by registrars and nurses for self-initiated quality and research projects following ethics committee approval. This resulted in an increase in the number of junior staff who had abstracts accepted for presentation at national scientific meetings.

Conclusion

As our experience has demonstrated, the successful implementation of a clinical outcome registry data collection in a financially constrained public hospital environment is challenging but possible. With hospital accreditation and funding models moving towards performance based quality indicators, collection of accurate and reliable information that adequately allows for quality indicators to be reported and outcomes benchmarked will become the cornerstone of providing (and being reimbursed for) clinical services. This is already occurring in the United States with implementation of the Affordable Care Act in 2016 with funding of joint replacements now based on outcomes and participation in a data registry a mandatory requirement for centres receiving Medicare funding [6]. With quality of care an important focus for the Australian Commission of Safety and Quality in Health Care, it is likely that the future of care delivery in this country will also involve the ability to quantify and report routinely on the outcomes of that care. Registries are being seen as the vehicle through which hospitals will be able to adequately and reliably report to stakeholders on the quality of care provided.

We believe the model of embedding data collection within the normal structure of a public hospital cardiology service is applicable to other clinical registries. We plan to use the same principles when implementing a new Cardiac Implantable Device registry. To this end, the model of implementation of the VCOR registry data collection described in this paper may be of assistance to hospitals considering engagement in similar clinical quality registries.

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Conflict of Interest

Acknowledgements

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