



Indicators for
Quality Use of Medicines
in Australian Hospitals

Final Report of 2011
Survey:
QUM Indicator Uptake
and Utilisation,
September 2012

Promoting the quality use of medicines

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Background and Aims

In 2007, the NSW Therapeutic Advisory Group (NSW TAG), supported by the Clinical Excellence Commission (CEC), developed a comprehensive set of process indicators for measuring quality use of medicines (QUM). The 30 indicators represent 6 domains of care: antithrombotic therapy, antibiotic therapy, medication ordering, pain management, continuity of care and hospital wide medication management policies and are displayed in 2007 Indicator Summary Section of the 2012 NSW TAG Report of the QUM Indicators project to the Australian Commission on Safety and Quality in Health Care (ACSQHC). The indicators also represented the components of the quality use of medicines paradigm: judicious selection, appropriate use and safe and effective use. The Indicators for Quality Use of Medicines in Australian Hospitals, 2007ⁱ (*QUM Indicators 2007*) were published as a paper-based manual and made publically available for download from the NSW TAG website (www.nswtag.org.au).

The purpose of measuring indicators is to inform an ongoing program of continuous quality improvement. Indicators allow a consistent but practical approach to monitoring aspects of care. The measurement process alone will not result in improvement; it must be used in combination with actions to change or inform structures and processes on the basis of results. Further measurement enables evaluation of intervention impact over time and therefore the value of indicators is fully realised with repeated measurement and coordination over time.ⁱ

One of the recommendations made following the development of the *QUM Indicators 2007* was to facilitate access by hospitals to an electronic application for locally monitoring indicator results over time, ideally using principles of statistical process control that will enable and encourage clinicians to drive local quality improvement initiatives. This application would optimally feed into a database for state-wide and national monitoring. Such a system would also enable immediate feedback of results directly to the clinicians entering the data. To date this recommendation has yet to be realised and as a result there is very little information available regarding the use and uptake of the *QUM Indicators 2007* by Australian hospitals.

A survey of Australian hospitals and area health services with a known drug and therapeutics committee was conducted by NSW TAG between October and November 2011 as part of the review of use of the *QUM Indicators 2007*.

The survey aimed to identify:

- Which QUM indicators are currently used in Australian hospitals?
- How and why specific QUM indicators are used?
- Reasons why specific QUM indicators may not be used, and
- Amendments made to specific QUM indicators by hospitals and jurisdictions in order to facilitate their use.

Methods

An estimated 163 hospital pharmacy departments and health services, identified using the NSW TAG contact list, were invited to participate in a survey to report on uptake and utilisation of the *QUM Indicators 2007*. Survey invitations were sent to 70 NSW hospitals or Local Health Districts, 2 ACT hospitals, 41 Victorian hospitals or health services, 9 Queensland hospitals, 9 South Australian public hospital drug and therapeutic committees (DTCs), 23 public and larger private hospitals in Western Australia, 4 Tasmanian hospitals and 5 Northern Territory hospital DTCs. An invitation for participation (Appendix 1) and the survey tool (Appendix 2) were distributed by email. Recipients were asked to pass the survey on to their constituent hospitals and facilities. The survey requested that sites complete a spreadsheet (Microsoft Excel®) indicating use or non-use of each of the 30 indicators and included a section for comments.

In order to elicit information regarding the ways *QUM Indicators* were being used, sites were requested to specify if each indicator had been used once, more than once, regularly, never used, or if an amended version had been used. Sites were requested to document any reasons why they had specifically chosen to not use an indicator, or to document explanations as to why and how they may have developed their own amended version of a QUM indicator.

Individual hospitals and jurisdictions were requested to respond directly to NSW TAG. All responses were collated and analysed in December 2011. A number of sites and jurisdictions were contacted directly to gain more information and a better understanding of coordinated indicator activities or programs that were in place.

Results

Responses were received from 38 hospitals and jurisdictions representing all Australian states and territories (page 29). This represented a 23% response rate. Completed survey sheets were received

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from 36 respondents. Two sites, a rural NSW hospital and the Northern Territory jurisdiction, reported that they had not used any of the QUM indicators, with a lack of resources to undertake the activities being the primary reason. Both of these sites anticipated value in undertaking the activity if resources permitted them. A summative table of responses to each survey question forms Appendix 3 of this report.

With the exception of the two sites reporting that they were unable to use any of the indicators, there were no indicators that had not been employed in some form.

With the exception of the Northern Territory, the QUM Indicators are reportedly being used in all the Australian states and territories. The majority of respondents were hospitals in metropolitan areas or larger rural centres. Three respondents represented area health services.

1. Use of QUM Indicators

Overall, utilisation showed significant acceptance of indicators as tools to measure quality use of medicines. Table 1 describes the frequency of indicator use by the 36 respondents.

Table 1: Aggregated breakdown of responses for use of all indicators, n=36.

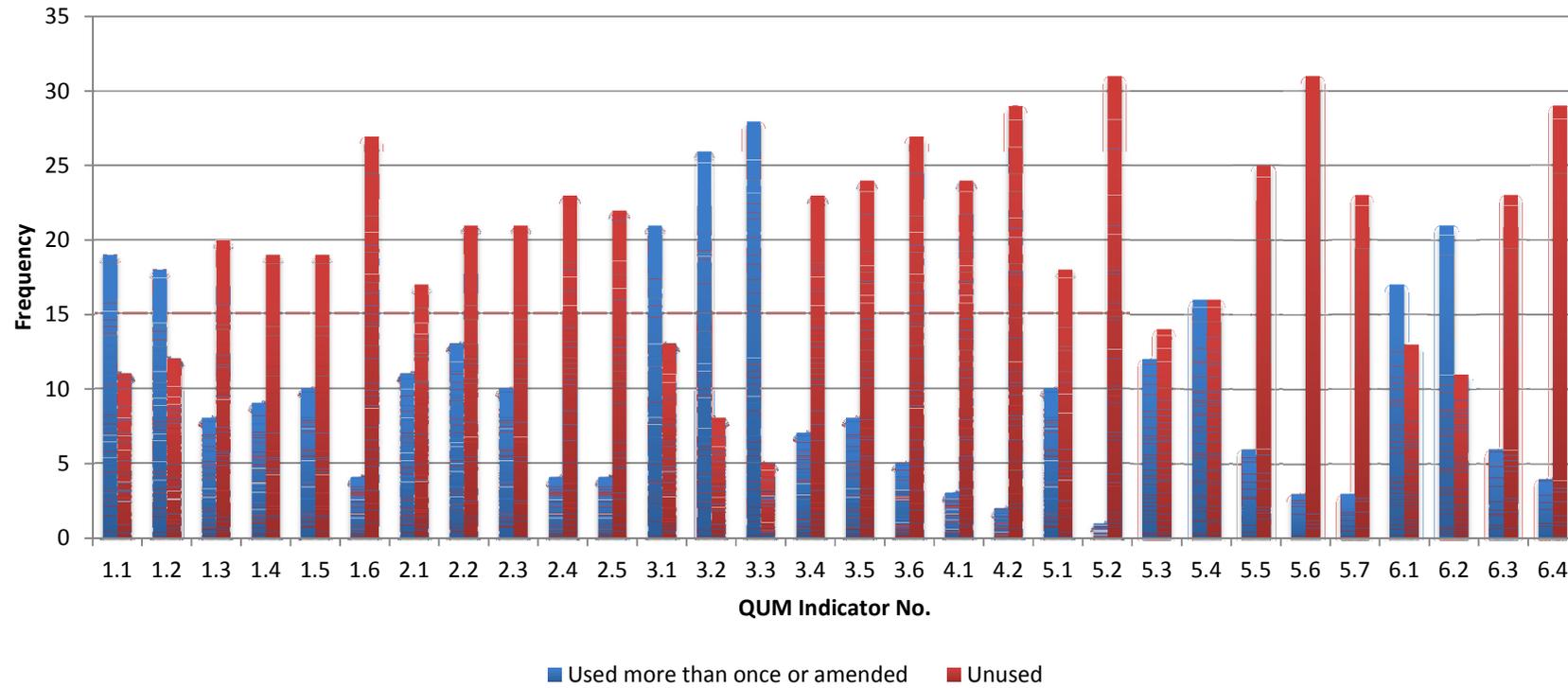
Used regularly	Used more than once	Used once	Used an amended version	Never used
110	120	120	79	599

Table 2 indicates the QUM indicators most commonly used by hospitals and their QUM domain. Indicators representing various aspects of medication ordering were most frequently used. Figure 1 displays the indicators most frequently used (either as originally designed or amended) and the indicators, which are most frequently never used.

Table 2: Top 10 indicators reported as used more than once or regularly, n=36.

Indicator No and Description	QUM domain	No of hospitals
Antithrombotic therapy		
1.1 Percentage of admitted adult patients that are assessed for risk of venous thromboembolism	Judicious selection	13
1.2 Percentage of patients at high risk of venous thromboembolism that receive appropriate prophylaxis	Appropriate choice	14
Antibiotic therapy		
2.2 Percentage of prescriptions for restricted antibiotics that are concordant with DTC approved criteria	Appropriate choice/ Safe and effective use	9
Medication ordering		
3.1 Percentage of patients whose current medications are documented and reconciled at admission	Appropriate choice/ Safe and effective use	15
3.2 Percentage of patients whose known adverse drug reactions are documented on the current medication chart	Appropriate choice/ Safe and effective use	22
3.3 Percentage of medication orders that include error-prone abbreviations	Safe and effective use	24
Continuity of care		
5.3 Percentage of discharge summaries that include medication therapy changes and explanations for changes	Safe and effective use	11
5.4 Percentage of patients discharged on warfarin that receive written information regarding warfarin management prior to discharge	Safe and effective use	13
Hospital wide medication management policies		
6.1 Percentage of medication storage areas outside pharmacy where potassium ampoules are available	Safe and effective use	15
6.2 Percentage of patients that are reviewed by a clinical pharmacist within one day of admission	Judicious selection/ Appropriate choice/ Safe and effective use	17

Figure 1: Frequency of used and unused QUM indicators, n=36.

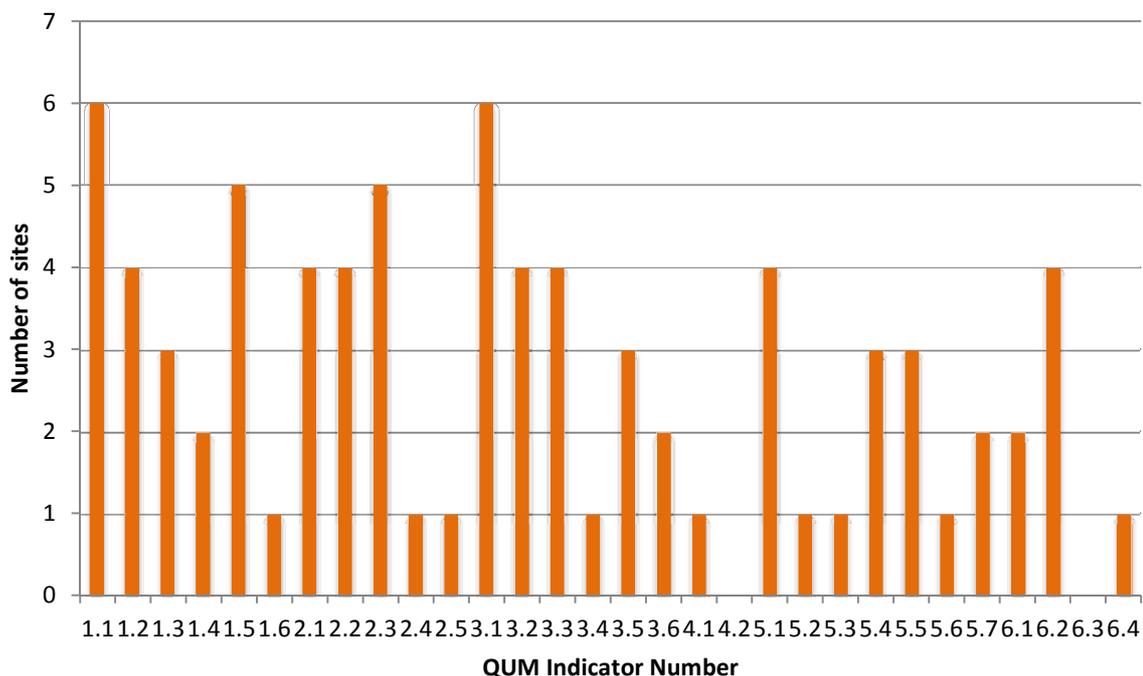


Indicator descriptions can be found in Appendix 2.

2. Amendments made to QUM Indicators

Respondents documented seventy-nine occasions when an amended version of a QUM indicator had been used. The most common amended indicators were 1.1, 1.5, 2.3 and 3.1, as shown in Figure 2. The most common reason for amendment was to align with requirements for data collections with respect to National Inpatient Medication Chart audits or jurisdictional reporting in Queensland and Western Australia. Other indicator amendments were due to changes in national guidelines or a focus on venous thromboembolism (VTE) prophylaxis. For example, a number of hospitals were undertaking projects regarding VTE prophylaxis but had amended *Indicator 1.1* to exclude a time limit of one day or exclude palliative care patients. With respect to *Indicator 2.3*, one major hospital provided individualised therapeutic drug monitoring via the pharmacy department for all directed aminoglycoside therapy. Another had amended *Indicator 2.3* to report percentage of patients prescribed gentamicin as directed therapy for an appropriate duration.

Figure 2: Frequency of amended indicator use, n=36



3. QUM Indicator Under-utilisation

All indicators had been used at least once. However some indicators were more commonly 'never used'. These can be seen in Figure 1 and are displayed in Table 3, according to areas of practice and QUM domain. Comments relating to the use of these indicators can be found in Appendix 4.

Table 3: Indicators most commonly 'never used' by sites (that is, by 25 sites or more), n=36

Indicator No. and Title	QUM domain	No of sites
Antithrombotic therapy		
1.6 Percentage of patients with atrial fibrillation that are discharged on warfarin	Judicious selection	27
Medication ordering		
3.6 Percentage of patients receiving cytotoxic chemotherapy whose treatment is guided by a hospital approved chemotherapy treatment protocol	Safe and effective use	27
Pain management		
4.2 Percentage of postoperative patients that are given a written pain management plan at discharge and a copy is communicated to the primary care clinician	Safe and effective use	29
Continuity of care		
5.2 Percentage of patients with chronic heart failure that are prescribed appropriate medications at discharge	Judicious selection Appropriate use	31
5.5 Percentage of patients with a new adverse drug reaction (ADR) that are given written ADR information and a copy is communicated to the primary care clinician	Safe and effective use	25
5.6 Percentage of patients with asthma that are given a written asthma action plan at discharge and a copy is communicated to the primary care physician	Safe and effective use	31
Hospital wide medication management policies		
6.4 Percentage of submissions for formulary listing of new chemical entities for which the Drug and Therapeutic Committee has access to adequate information for appropriate decision making	Appropriate choice Safe and effective use	29

If poor use of indicators is determined by meeting a threshold of 30 or more respondents who 'never used' or 'used only once', additional indicators are implicated. These include *Indicators 2.4 and 2.5*,

which both target areas of practice around community acquired pneumonia; *Indicator 4.1*, which targets pain measurement; and, *Indicator 5.7*, which targets use of sedatives at discharge.

4. Barriers to QUM Indicator Use

Comments regarding the difficulties in indicator use were received (Appendix 4). In New South Wales, data collection was reported to be hindered through recent re-organisation of the previous Area Health Services to the new Local Health Districts of a different size and composition.

The sample size required for some QUM activities involving the *QUM Indicators 2007* or other QUM work was perceived by one respondent to be unworkable. For example, the sample size required for the international High 5s medication reconciliation programⁱⁱ was regarded by some as being unfeasible.

5. Comparative data collections

Given the retrospective nature of the NSW TAG indicator survey, it was considered appropriate to place the data claimed to be regularly collected into the perspective of other regular data collections. Table 4 displays the compatibility of the *QUM Indicators 2007* with current national and state indicator sets.

Table 4: QUM Indicator compatibility with current national and state indicator sets

Top 10 QUM Indicators in use

QUM Indicators not commonly used

Indicator	ACHS ⁱⁱⁱ	NSQHSS ^{iv}	NIMC audit ^v	APAC ^{vi}	SQuIRE ^{vii}	KPIs QLD ^{viii}
1.1			✓ 5.1		✓ 8.3.1.1	
1.2			✓ 5.2		✓ 8.3.1.2	
1.3						
1.4	✓ 5.5					
1.5	✓ 5.4			✓ GP5		
1.6						
2.1		✓ 3.1, 3.4			✓ 8.3.6.1b	
2.2		✓ 3.1, 3.4			✓ 8.3.6.1b	
2.3	✓ 6.1*	✓ 3.1		✓ GP5		
2.4		✓ 3.1				
2.5		✓ 3.1, 3.4				
3.1		✓ 4.6.1, 4.8.1	✓ 3.1	✓ GP3/4/5	✓ 8.3.5	✓ KPI
3.2	✓ 3.1	✓ 4.7.1	✓ 2.1, 3.4	✓ GP4		✓ KPI
3.3	✓ 4.1					✓ KPI*
3.4						
3.5			✓ 8.1, 8.2			
3.6						
4.1						
4.2						
5.1					✓ 8.3.3.3*	
5.2						
5.3		✓ 4.12.1		✓ GP 9	✓ 8.3.5.2a	✓ KPI*
5.4	✓ 5.3		✓ 6.5			
5.5						
5.6						
5.7						
6.1						
6.2			✓ 10.1	✓ GP5		✓ KPI
6.3						
6.4						

*Modified indicator wording

ACHS: The Australian Council on Healthcare Standards; NSQHSS: National Safety and Quality Health Service Standards; NIMC: National Inpatient Medication Chart; APAC: Australian Pharmaceutical Advisory Council; SQuIRE: Safety and Quality Investment for reform; KPIs QLD: Key performance Indicators Queensland

The Australian Council on Healthcare Standards (ACHS)ⁱⁱⁱ: A number of the *QUM Indicators 2007* have been included in the ACHS accreditation programs. These indicators are already in widespread use throughout Australia and their use has clearly contributed to the NSW TAG survey results as a number of these indicators were ‘used regularly’ (QUM indicators 1.4, 1.5, 3.2, 3.3, 5.4). These indicators may be used in the present EQUIP 5 system^{ix}, to satisfy evidence required for the mandatory ACHS criterion 1.5.1 “Medications are managed to ensure safe and effective patient/consumer outcomes”.

The Australian Commission on Safety and Quality in Health Care (ACSQHC) National Inpatient Medication Chart (NIMC) audit^v: Measures used to audit the safe and quality use of the NIMC are necessarily interim and once the chart has moved past implementation phase in all its iterations, audit may become less common. However several key safety measures, which are currently part of the audit, should not be lost as ongoing quality indicators.

Australian Pharmaceutical Advisory Council (APAC) Guiding Principles to Achieve Continuity in Medication Management (2005)^{vi}: This widely recognised practice standard for continuity of care from acute to community sectors includes several guiding principles relating to the indicators and some respondents were collecting data according to these principles.

Jurisdictional data collections: Several jurisdictions have projects underway related to state quality standards. These projects collect data similar to the *QUM Indicators 2007*. For example, Western Australia Department of Health and Queensland Health perform periodic collections of data closely matching the *QUM Indicators 2007*.

- **Western Australia Clinical Practice Improvement (CPI) SQulRe^{vii} Program**

The Western Australian (WA) Department of Health have established the Safety and Quality Investment for Reform (SQulRe) program, which includes funding for WA hospitals to improve practice in a number of key clinical areas. Hospitals are required to provide reports on eight mandatory clinical improvement initiatives, some of which relate to QUM. For example:

Cluster 1 – Evidence-based Care Processes – AMI

Goal: To optimise clinical care for acute myocardial infarction

Implement: make necessary changes to reach 100% compliance with:

1. Early aspirin where appropriate
2. Timely initiation of reperfusion
3. Discharge medication regimen – statin, anti-platelet, ACE / ARB, beta blocker

Cluster 1 – Evidence-based Care Processes – VTE

Goal: To prevent venous thromboembolism in hospitalised patients

Implement: make necessary changes to reach 100% compliance with:

1. Assessing patients for risk of DVT
2. Applying appropriate preventive measures

Other evaluated areas with QUM relevance include medication safety using medication reconciliation and hospital infection prevention and control.

- **Queensland Health Key Performance Indicators (KPIs)**^{viii}

Many Queensland Health Hospitals report a mandatory series of Key Performance Indicators. For example:

- % Patients (non same day separations) receiving a medication list
- INR results greater than 5
- charts reviewed, interventions
- medical & surgical patients reviewed by a pharmacist within 24hrs

It is expected that these collections may move to a national focus as the Commission further develops its national accreditation standards.

6. Use of QUM Indicators relating to Specific Drug Classes or Conditions

A number of issues relating to utilisation of specific indicators also emerged from the survey data and accompanying comments. These are summarised below.

6.1 Antithrombotics

Three of the six indicators relating to the quality use of antithrombotics were frequently used (*QUM Indicators 1.1, 1.2 and 5.4*). Similar indicators are measured in other programs, such as the ACHS and NIMC audits.

6.2 Antibiotics

There are currently five indicators addressing the use of antibiotics. *QUM Indicator 2.2* was one of the top ten most frequently used indicators. Five sites reported using this indicator on a regular basis. The indicators targeting antibiotic therapy were the least likely indicators to be 'never used'. The least frequently used antibiotic indicators were those that targeted community acquired pneumonia (*QUM Indicators 2.4 and 2.5*).

Comments on the antibiotic indicators revealed that many sites were in the process of establishing antimicrobial stewardship programs. The inherent importance of these indicators was acknowledged. A number of sites commented that they were planning to collect similar data using the antibiotic therapy indicators in forthcoming antimicrobial stewardship programs.

Several hospitals reported having locally modified *QUM Indicator 2.3*. The most common reason was to further define the indicator so that it targeted 'directed therapy' in line with the most recent Therapeutic Guidelines: Antibiotics^x.

6.3 Pain Management

The indicators of pain management were under-utilised. Comments from respondents suggested that they believed the hospital pain team would collect similar data or that involvement in the NPS: Better choices, Better health's *Acute Postoperative Pain Project*^{xi} had been undertaken in 2006 and further audit was not currently warranted.

6.4 Acute coronary syndrome and chronic heart failure

Indicators 5.1 and 5.2 were rarely used. Comments from respondents suggested that hospitals had taken part in the NPS: Better choices, Better health's *Discharge Management of Acute Coronary Syndrome Project*^{xii} and that further audit was not currently warranted. There was also a perception that this data was collected by specialist cardiac teams and the required data would be difficult to collect.

Discussion

A survey response rate of 23% (38/163) is consistent with rates from similar email surveys. All but two respondents had used one or more of the *QUM Indicators 2007*. It is likely that the vast majority of non-respondents had not used the QUM indicators and this influenced their decision not to respond. Such an assertion is extrapolated from NSW data and the comments received during this survey (see page 18). In this study, 70 NSW hospitals or Local Health Districts were contacted. However feedback to NSW TAG indicates that the majority of hospitals, particularly smaller hospitals and those in rural and remote areas (representing 70 percent of NSW hospitals) do not have the staff or resources to conduct audits using the *QUM indicators 2007*. Such a result highlights the need for readily available, quick and easy-to-use audit tools to assist hospitals undertaking quality improvement studies, particularly if used to demonstrate achievement of accreditation standards.

Survey respondents acknowledged the value of the indicators and recognised their ability to drive practice improvement. All indicators had been used since publication in 2007, with some indicators reportedly used more frequently than others. The most frequently used indicators match items in data collections used for other purposes. For example, *QUM Indicator 3.2* forms part of the recommended criteria used in five of the six listed national or state-based indicator sets. A similar pattern is seen with *QUM Indicators 3.1 and 5.3*. However this is not the sole criterion for frequent use as evidenced by the popularity of *QUM Indicator 3.3*, which is only a requirement of two other indicator sets. *QUM Indicator 3.1* was also reported as regularly collected by hospital pharmacy service directors as a measure of service delivery. The fifth most frequently used indicator (*QUM Indicator 1.1*) relates to prevention of venous thromboembolism (VTE), which is an area of current attention. This follows the 2009 publication

of the National Health and Research Medical Council's Clinical Practice Guideline for the Prevention of Venous Thromboembolism in Patients Admitted to Australian Hospitals.^{xiii} The recent focus on improving practice in this area, including results from recent pilots of a new NIMC featuring a VTE risk assessment tool, may have facilitated use of this indicator.

Frequency of indicator use should not be the sole criteria for indicator retention. Some indicators are targeted at special patient groups that may attend specialist hospitals, and may appear underutilised for this reason. The results suggest that these indicators were more likely to be used by specialist hospitals. For example, *QUM Indicator 3.4* focuses on safe prescribing for paediatric patients and was used in a paediatric hospital. It should be understood when interpreting the survey data that some hospitals whose focus is adult medicine would never use this indicator. This qualification may also apply to Indicator 3.6, which evaluates the use of chemotherapy treatment protocols.

Another important consideration in the utility of the *QUM Indicators 2007* at the time of the survey is their currency with evidence-based guidelines. For example, Australian guideline recommendations regarding the use of aminoglycosides^x have recently changed. Aminoglycoside dosing recommendations, incorporating different approaches for empirical and directed therapy, have meant respondents have often amended *QUM Indicator 2.3* or delayed its use. Thus revision of indicators must be periodic and new indicators developed or modified to meet current recommendations. Newly developed indicators will require wide consultation and field-testing as occurred with the development of the *QUM Indicators 2007*.

The above caveat regarding the revision and development of new indicators also applies to *QUM Indicators 1.4 and 1.5*, which will remain relevant to practice as long as warfarin remains a treatment option. The availability of new oral anticoagulants as alternatives to warfarin is likely to result in clinical practice change over the next few years. The safety and role in practice of these alternatives, which can also be classed as high-risk medicines, is yet to be fully determined. However future practice change will likely require modification or replacement of *QUM Indicators 1.6 and 5.4* with the new indicators' purpose to drive practice change that ensures judicious selection of therapy in patients with atrial fibrillation and education of patients on oral anticoagulants.

Changes in the terminology used in individual indicators or expanded QUM targets must also be considered. For example, antimicrobial stewardship, is a major current focus of quality health care strategies. The use of 'antimicrobial' may be more appropriate terminology for an indicator previously targeting antibiotic use. For example, *QUM Indicator 2.2 'Percentage of prescriptions for restricted antibiotics that are concordant with DTC approved criteria'* could be modified to '*Percentage of prescriptions for restricted antimicrobials that are concordant with DTC approved criteria'*'. Any change to the wording of an indicator would require wide consultation.

Poor use of indicators by survey respondents should not necessarily be seen to devalue those indicators. In many cases, the indicator's importance was often acknowledged by the respondents. Instead other priorities had intervened or planning was underway for future collection. In a few cases there were collaborative plans to establish a future regular audit program using the *QUM Indicators 2007*.

Some respondent sites were participating in the World Health Organisation's *High 5s Medication Reconciliation project*^{ix}, sponsored in Australia by the Australian Commission on Safety and Quality in Health Care (ACSQHC), hence that data collection took priority. Similarly, several hospitals reported participation in NPS: Better choices, Better Health audits such as the *Discharge Management of Acute Coronary Syndrome Project*^{xi}, hence non-use of *QUM Indicator 5.1*. In other cases, different tools were in use for collection of similar data, for example, Peninsular Health in Victoria utilise an Electronic VTE Risk assessment tool (ELVIS)^{xiv}.

Wide participation in the 2006 NPS: Better choices, Better health *Acute Postoperative Pain Project*^x required sites to collect data including documentation of pain scores. Many sites reported that local practice had changed as a result of this project. Because of this activity in 2005 and 2006, hospitals had not used *QUM Indicators 4.1 and 4.2*. Such an observation suggests that some sites may not understand the value of repeated evaluation of an indicator to assess whether practice change is maintained or could be improved. Periodic education regarding the benefits of indicator measurement and follow-up action, if necessary, is likely required. The use of *QUM Indicators 4.1 and 4.2* may increase with the introduction of new pain charts.

Another important aspect is to consider the current and future users of the *QUM Indicators 2007*. For example, the inclusion of *QUM Indicator 6.3* in the *QUM Indicators 2007* was driven by results of a 2002/3 NSW TAG project, *Improving Analgesia in Hospital Emergency Departments – Optimising Use of Pethidine*^{xv}. The project identified that pethidine was widely used in hospital emergency departments, despite safer alternatives being available. This project, its supporting material, publicly available on the NSW TAG website and use of *QUM Indicator 6.3* appear to have driven clinical practice change, as many hospitals reported having removed pethidine from their formularies or restricting its use. Despite this anecdotal evidence that pethidine may not be as great a QUM issue as previously, these results are confined to public hospitals and may be applicable to private hospitals and other health care institutions. As a result, *QUM Indicator 6.3* remains relevant and should ensure maintenance of this positive change in practice.

Survey results indicated that all QUM domains were measured. Use and non-use of indicators did not appear to be influenced by the QUM domain although indicators targeting 'judicious selection' appeared to be the least likely QUM domain to be measured. Further investigation is required to determine whether this might be so, and if so, whether it requires attention.

Seven indicators were never measured in 25 or more sites. This was despite the fact that a number of respondents acknowledged the gap in practice that these indicators sought to measure. The most striking feature of this result is that five of the seven indicators measure medication use around the hospital discharge process. There may be a number of reasons for this but the most likely is the resource-intensive nature of data collection for indicators around the discharge process, for example the need to obtain medical records to collect data and the reliance on documentation detailing an action involving communication prior to discharge. Other possible reasons include that these indicators are seen as a low priority, that the data has been collected by other projects or other clinical groups, or that the indicator did not apply to the hospital's clinical area. In contrast, those indicators targeting the admission process (medication reconciliation and the clinical pharmacist review) were amongst the most frequently collected indicators. This is likely to be a result of recent efforts by national bodies such as the Commission to promote and measure activities such as medication reconciliation, which are most commonly performed by a clinical pharmacist. Acknowledgement of the difficulties around transfer of information at discharge has also led to a concerted effort to improve discharge summary documentation with the NSW TAG Drug Utilisation Support Group conducting a study in a number of hospitals around Indicator 5.3.^{xvi} Given the Commission's focus on continuity of care outlined in its Australian Safety and Quality Goals for Health Care consultation paper,^{xvii} ways to facilitate collection of indicator data around the discharge process are required. It is likely that measurement and reporting of these measures will be enhanced with the use of electronic medication management processes in hospitals, especially if data is uploadable to a centralised web-based reporting system. The Enterprise-wide Liaison Medication System (eLMS) in Queensland is an example of an electronic medication management system already in use that facilitates discharge reconciliation and assists collection of discharge data.^{xviii}

Concerns regarding sample size requirements for audits that were noted in the survey and have also been noted in similar NSW TAG projects could also be allayed with the use of electronic medication management systems.

The other two indicators that were not commonly used rely on documentation by drug and therapeutics committees (DTCs) and results suggest there is an actual or perceived barrier to data access or data collection involving DTCs. Further work is recommended to ensure QUM indicators are available to meet the needs of DTCs. The three respondents from area health services reported low use of these indicators, suggesting the same recommendation applies to area DTCs.

The three responses from area health services suggested that indicators related to antithrombotic and antibiotic use were the most likely to be used across an area health service, because there was likely to be an area-wide policy related to these issues and support from specialised sub-committees. In general, the area health services reported that most of the *QUM Indicators 2007* were not applicable for area-wide use and would be difficult to measure.

Despite the strong evidence that discharge medication prescription in diseases such as acute coronary syndrome (ACS) and heart failure (HF) lead to improved patient outcomes,^{xix,xx} there was a poor use of *QUM Indicators 5.1 and 5.2*. There was a common perception amongst respondents that specialist clinical units may have been collecting indicator data because it reflects directly on their prescribing practices. In some cases, this was true and clinical teams or specialist working parties were known to be collecting their own related data. Nevertheless, it is likely that the value of these indicators would be enhanced if indicator collection and feedback were undertaken as a collaborative exercise. There is great potential for collaborative data collection for *QUM indicators 4.1, 4.2, 5.1 and 5.2*. Moreover, collaboration is more likely to drive and maintain practice change.

General comments on a low level of compliance with data collection were also related to the size of the hospital, its degree of specialisation and the common perception of a lack of resources to collect indicator data. Several sites indicated that unless the indicators were mandated and audits funded, there were insufficient resources to carry out measurement and implement any follow-up action. One site commented: *“It would be wonderful to address them all, with sufficient manpower”*.

Some respondents reported that similar data to the *QUM Indicators 2007* was routinely collected but not analysed, as recommended by the 2007 QUM Indicator methodology. A centralized web-based reporting system is a possible solution to this problem.

Several sites have been taking steps to systematise data collection through use of electronic tools. Electronic indicator reporting was seen as a method by which indicator audit and feedback could be enhanced. This will clearly be the methodology of the future and to avoid rework, reporting will be facilitated if built into clinical systems during commissioning.

Limitations of study

The results are based on the responses from 38 hospitals and jurisdictions, 36 of whom had used the indicators and two that had not. It is unknown how many hospitals or area health services in total have used the *QUM Indicators 2007*. Respondents were mostly representative of larger Australian hospitals, suggesting these sites are the most likely to use the *QUM Indicators 2007*. However, the lack of responses from smaller Australian hospitals may mean that valuable information about the utility of the *QUM Indicators 2007* in these sites has not been obtained and that barriers to their use in smaller sites have not been fully considered.

Conclusions

Survey results show that Australian public hospitals are aware of the *QUM Indicators 2007* and that they are well used, particularly when in alignment with other data collections used to assess quality in clinical practice.

Although the full spectrum of the *QUM Indicators 2007* is not in widespread use, this is not necessarily due to poor design or lack of utility but often due to competition for resources to measure indicators. Some indicators have gained priority over others for both practical and local reasons. Survey respondents commented that most unused indicators are worthy of data collection. Some indicators are not currently used due to changes to current best-practice guidelines since their publication and these will be the focus of an update to the 2007 indicator set.

Appendix 1: Survey letter

Dear QUM colleagues,

Indicators for Quality Use of Medicines in Australian Hospitals

NSW Therapeutic Advisory Group is currently reviewing the use of the 2007 published *Indicators for Quality Use of Medicines in Australian Hospitals*. (www.nswtag.org.au)

The aims of this review project are to identify:

- Which QUM indicators are currently used in Australian hospitals
- How and why specific QUM indicators are used
- Reasons why specific QUM indicators may not be used
- Any local amendments which may have been made to the QUM indicators in order to measure them

Your feedback is essential in assisting us to understand where and how the indicators are being used in order to develop new systems for developing, measuring and monitoring QUM indicators. The first stage of our review process is to request feedback from the Drug Committees of individual sites/Local Health Networks/Districts and jurisdictions across Australia regarding the use or non-use of each specific indicator. We request that you complete the attached table specifying the frequency that the indicators have been used in your healthcare area. We also request that you include the site information to help us ensure that we have received responses from a representative sample of Australian hospitals.

A second phase of the review process will follow this survey and involve further investigation/discussion into the usage of the Indicators. This second phase will be targeted at specific Indicator users/non-users and will not include each site that responds to this initial survey.

If you have any questions regarding this project please contact:

Mrs Gillian Sharratt

Executive Officer, NSW Therapeutic Advisory Group Inc Tel: 02 8382 2852

We appreciate your support in this important QUM activity and request that on completion of the attached form it be posted, faxed or emailed to the NSW TAG office at the details listed below by **Friday 28th October**.

Kind regards,



Appendix 2 Survey Tool

Name and position of person completing survey:

Name of organisation survey is being completed for: (eg Hospital, LHN/D or Jurisdiction)

Address of organisation survey is being completed for:

Contact telephone number: _____

Contact email address: _____

Please complete a response for every indicator by marking one of the 5 response options

	Used once	Used more than once	Used regularly	Never used	Used an amended version*
Antithrombotic Therapy					
1.1 Percentage of admitted adult patients that are assessed for risk of venous thromboembolism					
1.2 Percentage of patients at high risk of venous thromboembolism that receive appropriate prophylaxis					
1.3 Percentage of patients prescribed enoxaparin whose dosing schedule is appropriate					
1.4 Percentage of patients prescribed hospital initiated warfarin whose loading doses are consistent with a DTC approved protocol					
1.5 Percentage of patients with an INR above 4 whose dosage has been adjusted or reviewed prior to the next warfarin dose					
1.6 Percentage of patients with atrial fibrillation that are discharged on warfarin					
Antibiotic Therapy					
2.1 Percentage of patients undergoing specified surgical procedures that receive an appropriate prophylactic antibiotic regimen					

2.2 Percentage of prescriptions for restricted antibiotics that are concordant with DTC approved criteria					
2.3 Percentage of patients with a toxic or sub-therapeutic aminoglycoside concentration whose dosage has been adjusted or reviewed prior to the next aminoglycoside dose					
2.4 Percentage of adult patients with community acquired pneumonia that are assessed using an appropriate validated objective measure of pneumonia severity					
2.5 Percentage of patients presenting with community acquired pneumonia that are prescribed guideline concordant antibiotic therapy					
Medication ordering					
3.1 Percentage of patients whose current medications are documented and reconciled at admission					
3.2 Percentage of patients whose known adverse drug reactions are documented on the current medication chart					
3.3 Percentage of medication orders that include error-prone abbreviations					
3.4 Percentage of paediatric medication orders that include the correct dose per kilogram (or body surface area) and a safe total dose					
3.5 Percentage of medication orders for intermittent therapy that are prescribed safely					
3.6 Percentage of patients receiving cytotoxic chemotherapy whose treatment is guided by a hospital approved chemotherapy treatment protocol					
Pain management					
4.1 Percentage of post operative patients whose pain intensity is documented using an appropriate validated assessment tool					
4.2 Percentage of postoperative patients that are given a written pain management plan at discharge and a copy is communicated to the primary care clinician					
Continuity of care					
5.1 Percentage of patients with acute coronary syndrome that are prescribed appropriate medications at discharge					
5.2 Percentage of patients with chronic heart failure that are prescribed appropriate medications at discharge					

5.3 Percentage of discharge summaries that include medication therapy changes and explanations for changes					
5.4 Percentage of patients discharged on warfarin that receive written information regarding warfarin management prior to discharge					
5.5 Percentage of patients with a new adverse drug reaction (ADR) that are given written ADR information and a copy is communicated to the primary care clinician					
5.6 Percentage of patients with asthma that are given a written asthma action plan at discharge and a copy is communicated to the primary care physician					
5.7 Percentage of patients receiving sedatives at discharge that were not taking them at admission					
Hospital wide medication management policies					
6.1 Percentage of medication storage areas outside pharmacy where potassium ampoules are available					
6.2 Percentage of patients that are reviewed by a clinical pharmacist within one day of admission					
6.3 Percentage of parenteral opioid dosage units that are pethidine					
6.4 Percentage of submissions for formulary listing of new chemical entities for which the Drug and Therapeutic Committee has access to adequate information for appropriate decision making					

*When completing the table if you have any comments regarding reasons why you have specifically chosen to NOT use an indicator, or if you have explanations as to why and how you may have developed your own amended version of a QUM indicator please document them here, or submit any supporting information.

Comments:

Appendix 3 – Survey Results, n=36.

Indicator	Used once	Used more than once	Used regularly	Never used	Used an amended version*
1.1 Percentage of admitted adult patients that are assessed for risk of venous thromboembolism	4	5	8	11	6
1.2 Percentage of patients at high risk of venous thromboembolism that receive appropriate prophylaxis	4	7	7	12	4
1.3 Percentage of patients prescribed enoxaparin whose dosing schedule is appropriate	6	4	1	20	3
1.4 Percentage of patients prescribed hospital initiated warfarin whose loading doses are consistent with a DTC approved protocol	6	5	2	19	2
1.5 Percentage of patients with an INR above 4 whose dosage has been adjusted or reviewed prior to the next warfarin dose	5	2	3	19	5
1.6 Percentage of patients with atrial fibrillation that are discharged on warfarin	3	2	1	27	1
2.1 Percentage of patients undergoing specified surgical procedures that receive an appropriate prophylactic antibiotic regimen	6	4	3	17	4
2.2 Percentage of prescriptions for restricted antibiotics that are concordant with DTC approved criteria	1	5	4	21	4
2.3 Percentage of patients with a toxic or sub-therapeutic aminoglycoside concentration whose dosage has been adjusted or reviewed prior to the next aminoglycoside dose	4	4	1	21	5
2.4 Percentage of adult patients with community acquired pneumonia that are assessed using an appropriate validated objective measure of pneumonia severity	7	2	1	23	1
2.5 Percentage of patients presenting with community acquired pneumonia that are prescribed guideline concordant antibiotic therapy	8	2	1	22	1
3.1 Percentage of patients whose current medications are documented and reconciled at admission	1	2	13	13	6
3.2 Percentage of patients whose known adverse drug	1	10	12	8	4

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reactions are documented on the current medication chart					
3.3 Percentage of medication orders that include error-prone abbreviations	2	16	8	5	4
3.4 Percentage of paediatric medication orders that include the correct dose per kilogram (or body surface area) and a safe total dose	3	3	3	23	1
3.5 Percentage of medication orders for intermittent therapy that are prescribed safely	3	2	3	24	3
3.6 Percentage of patients receiving cytotoxic chemotherapy whose treatment is guided by a hospital approved chemotherapy treatment protocol	0	3	0	27	2
4.1 Percentage of post operative patients whose pain intensity is documented using an appropriate validated assessment tool	7	1	1	24	1
4.2 Percentage of postoperative patients that are given a written pain management plan at discharge and a copy is communicated to the primary care clinician	4	1	1	29	0
5.1 Percentage of patients with acute coronary syndrome that are prescribed appropriate medications at discharge	6	3	3	18	4
5.2 Percentage of patients with chronic heart failure that are prescribed appropriate medications at discharge	2	0	0	31	1
5.3 Percentage of discharge summaries that include medication therapy changes and explanations for changes	9	4	7	14	1
5.4 Percentage of patients discharged on warfarin that receive written information regarding warfarin management prior to discharge	2	7	6	16	3
5.5 Percentage of patients with a new adverse drug reaction (ADR) that are given written ADR information and a copy is communicated to the primary care clinician	3	1	2	25	3
5.6 Percentage of patients with asthma that are given a written asthma action plan at discharge and a copy is communicated to the primary care physician	1	2	0	31	1
5.7 Percentage of patients receiving sedatives at discharge that were not taking them at admission	7	1	0	23	2
6.1 Percentage of medication storage areas outside pharmacy where potassium ampoules are available	5	12	3	13	2

6.2 Percentage of patients that are reviewed by a clinical pharmacist within one day of admission	3	5	12	11	4
6.3 Percentage of parenteral opioid dosage units that are pethidine	5	5	1	23	0
6.4 Percentage of submissions for formulary listing of new chemical entities for which the Drug and Therapeutic Committee has access to adequate information for appropriate decision making	2	0	3	29	1
	120	120	110	599	79

Appendix 4 – Rationale for non-use of indicators

Indicators most often unused	Reported rationale
1.6 Percentage of patients with atrial fibrillation that are discharged on warfarin	<ul style="list-style-type: none"> - Although recognised as practice gap, no plans to re-educate prescribers at present. - currently collecting or planning to collect this data electronically
3.5 Percentage of medication orders for intermittent therapy that are prescribed safely	<ul style="list-style-type: none"> - considered unclear (one site). - attempt made to collect but resultant data found to be insufficient.(one site)
3.6 Percentage of patients receiving cytotoxic chemotherapy whose treatment is guided by a hospital approved chemotherapy treatment protocol	<ul style="list-style-type: none"> - not used or underused primarily from hospitals without oncology/haematology services. - using external electronic protocol databases (e.g. CHARM) which allow for new developments - undertaking selective audits
4.1 Percentage of post operative patients whose pain intensity is documented using an appropriate validated assessment tool	<ul style="list-style-type: none"> - similar work undertaken with the national Acute Postoperative Pain (APOP) project in 2006 . (No plans endorsed for further work in this area.) - pain teams reviewing this indicator or similar data. (Several sites)
4.2 Percentage of postoperative patients that are given a written pain management plan at discharge and a copy is communicated to the primary care clinician	<ul style="list-style-type: none"> - already undertaken for the national Acute Postoperative Pain (APOP) Project, 2006. (several sites) - data forms part of Pain Team quality measures.
5.2 Percentage of patients with chronic heart failure that are prescribed appropriate medications at discharge.	<ul style="list-style-type: none"> - other priorities intervened - perception that cardiology departments were themselves collecting similar data. - data felt to be difficult to easily collect.
5.5 Percentage of patients with a new adverse drug reaction (ADR) that are given written ADR information and a copy is communicated to the primary care clinician	<ul style="list-style-type: none"> - similar data collections undertaken e.g. <ul style="list-style-type: none"> • comparison of ADR documentation to discharge summaries. (one site) • incorporation of this data into issue of an individualised medication alert card. (one site) • WA hospitals collected similar data under the SQUIRE project. - poor results for this indicator expected, hence no plans to

	<p>collect data. (one site)</p> <p>- perceived rate of new ADRs (one site)</p>
5.6 Percentage of patients with asthma that are given a written asthma action plan at discharge and a copy is communicated to the primary care physician	<p>- a different audit tool was used to capture associated data (two respondents).</p> <p>- importance recognised and although collected for paediatric admissions, wider use only in the planning stage.</p>
5.7 Percentage of patients receiving sedatives at discharge that were not taking them at admission	<p>- considered difficult to audit (one site)</p> <p>- students to collect data. (one site)</p> <p>- querying what the resultant intervention would be if poor results were obtained. No plans to undertake this data collection. (one site)</p>
6.4 Percentage of submissions for formulary listing of new chemical entities for which the Drug and Therapeutic Committee has access to adequate information for appropriate decision making	<p>- submissions are not put to Drug Committee unless they are complete and have adequate information. (several sites)</p> <p>- use of a centralised jurisdictional formulary management system.(several sites)</p>

Acknowledgments

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Armadale Hospital, WA
Bankstown Hospital, NSW
Barwon Hospital, VIC
Belmont Hospital, NSW
Blue Mountains Hospital, NSW
Bowral Hospital, NSW
Bundaberg Hospital, QLD
Cairns Hospital, QLD
Canberra Hospital, ACT
Central Coast Local Health District, NSW
Concord Repatriation General Hospital, NSW
Eastern Health, VIC
Fairfield Hospital, NSW
Fremantle Hospital, WA
Graylands Hospital, WA
Hunter New England Local Health District, NSW
John Hunter Hospital, NSW
Launceston Hospital, TAS
North West Regional Hospital, TAS
Osborne Park Hospital, WA
Peninsula Health, VIC
Prince Charles Hospital, QLD
Prince of Wales Hospital, NSW
Queen Elizabeth Hospital, SA
Rockhampton Hospital, QLD
Royal Adelaide Hospital, SA
Royal Darwin Hospital, NT
Royal Hobart Hospital, TAS
Royal North Shore Hospital, NSW
Royal Victorian Eye and Ear Hospital, VIC
Sir Charles Gairdner Hospital, WA
South East Sydney Local Health District, NSW
St Vincent's Public Hospital, NSW
Sydney Children's Hospital, NSW
Sydney Eye and Ear Hospital, NSW
The Alfred Hospital, VIC
Townsville Hospital, QLD
Wagga Wagga Hospital, NSW

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