

AUSTRALASIAN CLINICAL INDICATOR REPORT

15th Edition 2006–2013



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The Australian Council on Healthcare Standards
Health Services Research Group, University of Newcastle

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Disclaimer

The expert commentary provided by the colleges, societies and associations is contributed in response to a request from ACHS. Although ACHS appreciates the insights provided, it does not necessarily agree with or endorse the views expressed.

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Scan with a smart phone or device to access 'Retrospective ACIR Data in Full'.

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Clinical Indicator Working Parties

The Australian Council on Healthcare Standards' (ACHS') Clinical Indicators (CIs) are developed by Working Parties comprised of practising clinicians (medical officers, nurses, allied health professionals in the relevant specialty field), representatives of the relevant Australian and New Zealand colleges, associations, societies, consumer representatives, statisticians and ACHS staff.

Selected Working Parties meet several times throughout the year, both in person and via teleconference, to review the existing CIs and explore areas for new CIs. The revised version of the CI set and its User Manual are then endorsed by the relevant colleges, associations and societies prior to implementation within the collection.

CI sets are regularly reviewed to ensure that:

- they are relevant for clinicians
- they continue to reflect today's healthcare environment
- there is a consensus on collection and reporting requirements
- the set is regarded as useful for quality improvement

CI set	Working Party Chair	Participating organisations
Anaesthesia	Dr Jo Sutherland (ANZCA)	Australian and New Zealand College of Anaesthetists Australian Society of Anaesthetists
Day Patient	Maralyn Masters (ADSC)	Australian Day Surgery Council Australian Day Hospital Association Australian Day Surgery Nurses Association
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Infection Control	Belinda Henderson In 2013, Claire Boardman (ACIPC)	Australian College for Infection Prevention and Control Healthcare Infection Control Special Interest Group
Intensive Care	Prof Mary White In 2013, Dr Tony Burrell (ANZICS)	Australian and New Zealand Intensive Care Society College of Intensive Care Medicine Australian College of Critical Care Nurses
Internal Medicine	Prof Donald Campbell (IMSANZ)	Internal Medicine Society of Australia and New Zealand, Royal Australasian College of Physicians Australian College of Nursing
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Radiation Oncology	Prof Christopher Hamilton (FACRO, RANZCR)	Faculty of Radiation Oncology, Royal Australian and New Zealand College of Radiologists Australian College of Physical Scientists and Engineers in Medicine Australian Institute of Radiography Australian Association of Private Radiation Oncology Practices
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Surgical	Position Vacant	Royal Australasian College of Surgeons

Foreword

On behalf of the Australian Council on Healthcare Standards, currently celebrating its 40th anniversary, I have the pleasure of presenting the 15th edition of the Australasian Clinical Indicator Report, which continues to facilitate the measurement of important aspects of health services for members of the Australian Council on Healthcare Standards, in addition to organisations around the world.

The 15th edition of the Australasian Clinical Indicator Report provides key points on significant trends, strata differences and outlier effects from data collected between 2006 and 2013 for a broad range of Clinical Indicators. The report is created for the healthcare industry, by the healthcare industry, ensuring its relevance in this ever-changing healthcare environment. The Australasian Clinical Indicator Report delivers an insight into health care in Australia and New Zealand, providing healthcare organisations with the potential to improve quality and safety through benchmarking against others within the industry.

The Australian Council on Healthcare Standards is proud to collaborate with over 40 Australasian medical colleges, societies and associations during the development of the Australasian Clinical Indicator Report, providing them with the opportunity to contribute comments within their specialist area for each of the 22 indicator sets, which now contain almost 350 individual indicators. Each set now has data that are collated from over 740 healthcare organisations and externally validated by University of Newcastle statisticians.

During 2013, the Australian Council on Healthcare Standards has made changes and improvements throughout the organisation. Within the Clinical Indicator Program a Performance Indicator Reporting Tool (PIRT) eLearning Module has been created to enhance user experience by providing an introduction to and demonstration of the tool. Working Parties were also held throughout the year to support the continuous improvement of the Clinical Indicator Program: Clinical Indicator sets

that were reviewed in 2013/14 include Anaesthesia, Gynaecology, Hospital Wide, Infection Control, Internal Medicine, Paediatrics, Radiation Oncology and Radiology.

Each year, the Australasian Clinical Indicator Report presents a feature report from professionals within the healthcare arena. In 2014, I am pleased to welcome back a leading force in the creation of the Clinical Indicator Program, Dr Brian Collopy, previous ACHS President and Board member, and awarded the ACHS medal in 1989. Dr Collopy is working in the role of Clinical Advisor, assisting with the revision of Clinical Indicator sets and new publications. In this report, he celebrates 20 years of data collection by the Australian Council on Healthcare Standards alongside 40 years of healthcare accreditation.

The Australian Council on Healthcare Standards provides this report to key health industry bodies, Federal and State Governments, ACHS members, ACHS surveyors and other interested parties. The report is available to download from the ACHS website at www.achs.org.au/publications-resources/australasian-clinical-indicator-report/. A full retrospective report will also be available, providing detailed results for each indicator set.

Finally, I would like to extend my appreciation to all cooperating organisations and individuals, including all collaborating colleges, associations and societies, for their continued support of the program, allowing us to continue our efforts to improve healthcare standards in Australia, New Zealand and further afield.



Adjunct Associate Professor Karen J Linegar FACN JP
President

September 2014

Key Results of 2013

This 15th edition of the Australasian Clinical Indicator Report 2006–2013 provides an overview of the results for each CI set for the last eight years, with additional commentary from the collaborating medical colleges, specialist societies and other clinical organisations. Their expertise provides context for any trends or variation observed in the data.

Improvements

Infection Control CI Set

Hospitals have undertaken a major attempt to reduce infections through the use of easily accessed alcohol based devices for staff, patients and visitors. The results of this program are seen in the significant decline in infection rates over the last eight years. For those CIs where there were enough data to report trends, 21 CI rates have favourably declined, including 4 CIs for MRSA (CIs 5.1 – 5.4), 6 surgical procedures: hip and knee prostheses (CIs 1.1 – 1.3), CABG (CIs 1.5 and 1.7), lower segment caesarean section procedures (CI 1.15), Haemodialysis (CIs 3.1 – 3.5), Oncology Unit CI and PI CLABSI (CIs 2.9 and 2.10) and Occupational exposures to blood and/or body fluids (CIs 6.1 and 6.2). These results support the continuing need for the “Clean Hands” programs in hospitals.

Emergency department patients attended within recommended time

The proportion of patients seen within the recommended times for Australasian Triage Scale (ATS) categories 1, 2, 3, 4 and 5 has continued to improve over the last eight years, with categories 2 – 5 reaching their highest level in 2013. The percentage of ATS category 1 patients seen immediately remains above 99% (Emergency Medicine CIs 1.2 – 1.5).

Total ED time exceeding 8 hours (access block) has declined from 35% to 20%, a significant improvement (Emergency Medicine CI 3.1).

Antibiotic prophylaxis in elective and emergency caesarean section

The proportion of women receiving an appropriate prophylactic antibiotic at the time of either an elective or emergency caesarean section has increased from 64.0% in 2008 (when the CI was first collected) to 92.5% in 2013 (Obstetrics CI 5.1).

Documentation of known adverse drug reactions

The rate for documentation of known adverse drug reactions (ADRs) on the patient's current medication chart has increased considerably since 2009 (when the indicator was first collected), 72.2%, to 90.6% in 2013 (Medication Safety CI 3.1).

Medication orders with error-prone abbreviations

The use of potentially dangerous abbreviations in prescribing has declined from 12.3% to 4.5% (Medication Safety CI 4.1).

Laparoscopic management of an ectopic pregnancy

The use of laparoscopic management of an ectopic pregnancy was reported by 30 HCOs over the last seven years and showed an increase from 72% to 86%, an increasing acceptance of best practice (Gynaecology 4.1).

Mental Health Inpatient CI Set

The Mental Health CIs highlighted many improvements, including the area of treatment patterns. Patients on 3 or more psychotropic medications at discharge have declined from 11.3 to 3.9 (CI 3.1). Patients having more than 12 treatments of ECT have been reduced to 7.9% from 11.3% (CI 4.1). The rate for patients having at least one episode of seclusion in an admission is now 6.6%, a decline from 10.1% (CI 5.1).

Venous thromboembolism prophylaxis

There has been a steady increase in rates for initiation of appropriate prophylaxis for venous thromboembolism in adult patients admitted to intensive care (within 24 hours of admission) (Intensive Care CI 3.1). There was also an increase for appropriate thromboprophylaxis for hysterectomy in patients >40 years from 79% to 95% (Gynaecology CI 7.1). The utilisation of evidence-based guidelines for thromboprophylaxis in high-risk medical patients was reported by 12 HCOs in 2013, with a high rate of 90% (Hospital-Wide CI 8.1).

Access to ICU

There has been an improvement in access to an ICU with a reduction in the rate for non-admissions to ICU and cancellation of elective admissions due to lack of resources (Intensive Care CIs 1.1 – 1.3).

Paediatrics CI Set

Documented immunisation status and planned or catch-up immunisation rates have improved by 1.4% to 88%, and by 6.4% to 66%, respectively (CIs 1.1 and 1.2).

Radiation Oncology CI Set

The waiting time for Radiation Oncology that exceeded 14 days has improved from 36% to 28% (CI 1.1). Documented informed consent for radiation has improved to 98% (CI 1.2).

Key Results of 2013 (continued)

Deteriorations

Emergency Department patients attended within recommended time

The rate of mental health admitted patients whose total ED exceeded 4 hours has increased to 55% from 42%. The metropolitan HCOs' rates were significantly higher than those for the rural HCOs. This increase is in contrast to the improvement in the overall triage times (**Emergency Medicine CI 3.2**).

Seclusion of mental health patients

The rate of mental health inpatients having seclusion for more than 4 hours remains at 50%, an increase from 40% in 2006 (**Mental Health Inpatient CI 5.3**).

Hospital admissions with pressure ulcers

The rate for inpatients admitted with pressure ulcers has increased substantially from 0.08% in 2007 (when the CI was first collected) to 0.49% in 2013. The rate at the 80th centile is 1.24%, while the 20th centile rate is 0.11%, indicating that major improvement is possible (**Hospital-Wide CI 3.2**).

Inpatient falls in patients 65 years or older

The proportion of inpatients aged 65 years or older that fall has increased slightly since 2008, from 0.46% to 0.54%. The combined rate of the 59 outlier reports is 0.90 per 100 patients (**Hospital-Wide CI 4.4**).

Pathology CI Set

There are four CIs for anatomical pathology, small and large biopsy. All had determination in rates between 5% and 17% over the period (**CIs 3.1 – 3.4**).

About the ACHS Clinical Indicator Program

The Australian Council on Healthcare Standards (ACHS) provides the world's largest dedicated Clinical Indicator (CI) data collection and reporting service. The Clinical Indicator Program (CIP) examines data sourced from a broad range of clinical specialty areas. It includes CIs that are relevant to inpatient, outpatient, and community health facilities, which were developed by specialist clinicians. With over 740 participating healthcare organisations (HCOs), it is a highly valued resource developed by Australian and New Zealand clinicians.

History

The ACHS CIP was established in 1989 through the initiative and perseverance of Brian Collopy¹, a surgeon and then Chairman of the ACHS Board, who still remains involved in the CIP today. The first set of CIs, the Hospital-Wide Medical CIs, were introduced into the accreditation program in 1993.

The rationale for introducing the program was to provide measures to support the clinical component of the ACHS accreditation standards and to increase the involvement of medical practitioners in quality improvement initiatives within HCOs. At the time of its introduction, doctors were familiar with the use of measures to assess a patient's health status, however there were almost no tools to assess the performance of a HCO when delivering clinical care.

From its inception over two decades ago, the CIP has expanded by working in collaboration with specialist colleges, societies and associations, to include a wide range of specialty areas¹, now totalling 22 CI sets.

**"If you can't measure it,
you can't manage it"**

Clinical Indicators and Healthcare Organisations

CIs do not provide definitive answers for HCOs. They are designed to indicate potential problems that may need addressing. This is achieved by identifying variations within data results. CIs are used to assess, compare and determine the potential to improve care within an organisation. They are, therefore, a tool to assist in assessing whether or not a standard of patient care is being met and can provide evidence for accreditation. HCOs select those CIs that are relevant to their organisation.

Clinical Indicators and Accreditation

The CIP was, and continues to be, **free** for all organisations that are accredited by ACHS. The CIP is one of a number of tools that facilitates the review and development of HCO performance. The data are not a focus for accreditation. Instead, surveyors are able to monitor the HCO's response to an outlier measure or a deteriorating trend. Was it investigated? What was learnt? What action had been, or would be, taken? What was the outcome of those actions? Accreditation with ACHS has always had a focus on quality improvement.

Supporting Clinical Indicator Program Customers

The Performance and Outcomes Service (POS) at ACHS provides email, telephone and workshop support to its members, including user access, CI collection assistance, clarification on the User Manuals and generation of customised reports.

Strengths of the Clinical Indicator Program

- Internationally renowned
- Well established with ongoing reviews
- Selection of CIs is determined by HCOs
- Endorsed by over 40 Australasian healthcare colleges, societies and associations
- Working Parties involving wide representation from relevant healthcare colleges, societies and associations, assisted by consumers and statisticians to ensure relevancy
- External validation of data by University of Newcastle statisticians
- ICD coding provided where applicable to aid data collection
- Current literature review on all new speciality areas available, providing background to the rationale for inclusion
- Developed by clinicians for clinicians to ensure relevancy and currency

Developed by Clinicians for Clinicians

Decisions are made on each CI set by a Working Party selected to provide broad representation. The ACHS Performance and Outcomes Service facilitates the process.

When developing CIs, ACHS relies on practising clinicians from specialist areas in public and private HCOs. Members of CI Working Parties encompass relevant professions, and include personnel from non-metropolitan centres and from a number of different states and territories. The Working Party Chair is selected by the lead college, society or association, which will also oversee and endorse the User Manual.²

Assisting with data analysis offering support and advice to the Working Parties is the Health Services Research Group (HSRG) at the University of Newcastle. Professor Bob Gibberd, who has consulted on the ACHS CIP for sixteen years, is supported by Mr Stephen Hancock, a statistician with a nursing background and access to a team that has made healthcare data its focus.

“Without data, it is just an opinion”

Comparisons of Performance

All participating HCOs receive reports that compare their performance to that of all other HCOs submitting data for the CI, and to HCOs from their peer group. Peer groupings are determined by the Working Party. Private HCOs may nominate to compare only to a private subgroup. Reports are prepared every six months following data submission. In addition, trend reports are developed for HCOs submitting regularly, which enable the HCOs to compare their own trended performance against that of the group overall.

By definition, 20% of all contributors of CI data must be in the poorer performing centile. This positioning does not necessarily reflect a poor performance level, as individual CIs may be associated with strong outcomes in a majority of reporting organisations. However, being in the poorer performing centile may indicate a greater opportunity for improvement.

As participation in the ACHS CIP is voluntary, the number of HCOs submitting data for any single CI may be small, therefore the sample may not represent the overall population. Furthermore, participating HCOs are not identified during statistical analysis, which limits comparisons between HCOs. The CIP's statisticians believe that, in most specialties, with greater numbers

comes greater confidence that the data are representative. For this reason, ACHS reports also include outlier data which notify an HCO that their rate is more than three (3) standard deviations from the mean. In conjunction with the centile data, outlier status provides HCOs with a realistic ‘snapshot’ of their performance against all other reports submitted for a specific CI.

The focus when collecting CI data should always be to identify opportunities for improvement.

Research in the area of organisational response to CI outcomes has identified the phenomenon of ‘data denial’, where HCOs are sometimes reluctant to accept the implications of CI data and reject the findings rather than investigate their implications, or seek explanations that are not associated with their own performance. Acceptance of the data as both correct and relevant is the first step towards positive action and change.³

It is necessary that clinicians and healthcare executives recognise that a CI result is a marker of change over time, rather than the equivalent of an ‘exam result’ with its designated pass / fail outcome. Although the ACHS CI reports provide data from multiple HCOs, CI data outcomes should not be considered as ‘league tables’.

CIs are so named because they do not provide answers; they ‘indicate’. This means an HCO's rate can raise questions for further evaluation. Considered analysis of potential reasons for trends over time and/or variation between HCOs can then be used to highlight quality issues or monitor progress of quality improvement initiatives.

“Developed by clinicians, for clinicians”

References

1. Banks G. ACHS 30 years. Sydney NSW; Australian Council on Healthcare Standards; 2004.
2. Australian Council on Healthcare Standards Performance and Outcomes Service. Clinical Indicator Program Information Sydney NSW; ACHS; 2013. www.achs.org.au/media/58466/achsclinicalindicatorprograminformation2013.pdf on 19 Oct 2013
3. Berwick DM, James B, Coye MJ. Connections between quality measurement and improvement. *Med Care*. 2003 Jan; 41 (1 Suppl): 130-8

About the Australasian Clinical Indicator Report

A Printed Report – a summary

This report summarises the Clinical Indicator (CI) data collected during 2013 by the ACHS Clinical Indicator Program (CIP), and for the years since 2006 for each individual CI that was available for collection.

The report uses tables to summarise the program, its membership and any significant trends or variation in the data over time. Reviewing trends and variation can suggest areas where there is scope to improve practice.

The summary of the results section, page 25, describes observations drawn from the data across groups of CIs with a common theme (known as 'areas'). CIs within a single area are designated the same whole number (e.g. 1), with individual CIs identified after the decimal point (i.e. 1.1, 1.2, etc.).

To capture the context and circumstances that influence the data, ACHS relies on the expertise of the specialist healthcare colleges, societies and associations, in addition to the other clinical organisations with which it collaborates. Their comments and expert feedback follow the summaries of the data and share subheadings with the Summary of Results and ACIR Retrospective Data in Full Report, to assist in cross-referencing.

The expert commentators review the retrospective data in full and respond to questions from ACHS. The views expressed in the commentaries are those of the authors, and not necessarily shared by ACHS.

Retrospective Data in Full Report – available online

Every year, the Australasian Clinical Indicator Report (ACIR) lists collective performance against each of the ACHS CIs. This information is published on the

ACHS website:

www.achs.org.au/publications-resources/australasian-clinical-indicator-report/ and

can be accessed by scanning this QR code with a smart phone or device.



In the Retrospective Data in Full Report, each CI collected in 2013 has a table that describes the CI, its intent and the significance of the numerator and denominator. Tables summarise the data submitted in every year since 2006 that the CI has been available for reporting.

For CIs of particular interest, readers should access the online data to obtain a detailed report on each CI, either by visiting the ACHS website or scanning the QR code found within the contents page of this edition of the ACIR with a smart phone / device.

Trends in the rates over time are reported with statistical significance, and the data are displayed using a graph if four or more years of data are available for five or more HCOs.

Three measures of variation in rates between HCOs are included. These are quantified by the differences between the 20th and 80th centiles.

Where significant differences between strata have occurred in 2013, these data are reported in additional tables, and the information is illustrated graphically using box plots. The absence of a specific comparator table means that the differences between strata were not statistically significant at three standard deviations or that agreed minimum numbers of contributors to enable comparison were not met.

Outlier information is displayed through funnel plots.

The full report also statistically estimates the potential improvement (gains) for all eligible CIs, if changes in the distribution of rates were achieved.

Statistical Methods

The statistical methods used to analyse and report these data are also available online at www.achs.org.au/publications-resources/australasian-clinical-indicator-report/, along with a description of how to read, understand and use the retrospective data.

Clinical Indicator User Manuals

CIP members can learn more details about the individual CIs in the ACHS CI User Manuals. Copies of the User Manual for each set of CIs can be accessed by CIP members from the ACHS website. The User Manuals include information such as:

- the rationale for CI development
- suggested sources for data collection (including ICD-10-AM codes where applicable)
- desired rates (i.e. should the organisation be aiming for a high or low rate?)
- stratification variables
- data cleaning rules
- uses of CI data as evidence for accreditation
- definition of terms
- numerator and denominator details.

Also included in the User Manuals are blank templates to assist HCOs to collect their data and retain details of their collection.

Feature Report: The Clinical Indicator Program 20 years on

Dr B. T. Collopy FRACS, FRACMA

Achievements and challenges

It is 21 years since the first set of Clinical Indicators (CIs) was introduced into the ACHS accreditation program and 20 years since data were first released from 115 Health Care Organisations (HCOs) on one set containing 15 Hospital-Wide CIs. It was a world first for accreditation programs. Five years later, data were being received from 550 HCOs on 15 CI sets containing 228 CIs. Now data are being received from over 740 HCOs on 22 sets containing nearly 390 separate CIs. This national clinical database, in its diversity, is the most comprehensive of its type in the world. The last printed report of the aggregate results was in 2003. If it was produced in hardcopy now it would amount to approximately 760 pages. For this reason, it is available via the Internet, or a hard copy summary of results remains available as the *Australasian Clinical Indicator Report*¹. Considering that the provision of CI data by HCOs is voluntary, this is a significant achievement.

The initial financial support from the Commonwealth Department of Health, which amounted to approximately \$2.2 million in three yearly grants over the first decade, and the professional support and cooperation of the Medical Colleges must be acknowledged. Early support from Baxter Healthcare P/L is also acknowledged.

The program was introduced to overcome the problem of an HCO receiving full accreditation and yet having poor patient outcomes, as surveyors had no appropriate measuring tools to assess the processes and outcomes of patient care within the facility.

There were three criteria required in the initial development of a CI, namely that the area or subject chosen was of clinical importance, that data were available for its assessment and that if used as a CI it could induce change. At the time the CIP was commenced, there was evidence in the literature of the appropriateness of most of the process CIs in patient management and the importance of outcome measures, such as wound infection, had long been recognised. However there was little information in the literature concerning their effectiveness, when used as measures of care.

These three criteria or attributes remain appropriate to use today and in more detail they are:

1. Clinical significance
 - 1.1 Disease burden (volume, cost, concern)
 - 1.2 Content validity (measure of quality)
 - 1.3 Evidence base (level of evidence)
2. Data value
 - 2.1 Data elements (definable, accessible)
 - 2.2 Reliability (accurate, reproducible)
3. Responsiveness (potential to improve care)

In the first few years of the program ACHS received both quantitative and qualitative data, the latter allowing ACHS to determine the HCOs' responses to receiving aggregate and, in particular, peer comparative data. The responses could be classified into five groups:

- A review of their data accuracy e.g. a further internal audit was performed
- Policy and procedure changes e.g. a change in antibiotic prophylaxis
- Education programs e.g. on thromboembolism prophylaxis
- New appointments e.g. a discharge planning officer
- Equipment changes e.g. with catheters etc.²

It is gratifying to note that, as recorded in the 14th edition of ACIR, in the majority of the CI sets data trending was in a desirable direction and in 7 of the sets more than two thirds of all their trended CIs showed improvement.¹ Thus improvement in both the process and the outcome of care can be demonstrated in the CI data.

Cost-avoidance can also be shown, for example with the generic CI "*Unplanned Readmission*", the rate in 1998 was approximately 2.2% and in 2012 it was 0.53%. The cost avoidance (through the decreased rate) for the year 2012 could amount to well over \$100 million.

The re-admission rate could be reduced by increasing the patient length of stay (LOS), but with activity-based funding HCOs would not be encouraged to do so and the average LOS has declined markedly over the years the CI has been in place. It is likely that the introduction of the unplanned re-admissions CI did have an influence through the action taken by HCOs of employing nurse discharge planners.

As medical care continues to evolve and improve one constant challenge, from the program's inception, is to ensure that the CIs chosen remain current and the cooperation, support and participation of practicing clinicians is maintained. Much time, effort and funding has been directed at periodic revision of the various CI sets, such that the versions of the sets used in 2012 ranged from one (1), the most recently introduced Gastrointestinal Endoscopy set, up to 11, for the first set introduced, the Hospital-Wide CIs. The Surgical set of CIs has not been revised for over a decade and the Royal Australasian College of Surgeons is more supportive of national audits conducted in specific disciplines, such as vascular surgery. Some of the surgical CIs could be addressed in the Hospital-Wide set as the successful management of patients undergoing complex procedures, such as coronary artery grafts is essentially multi-disciplinary.

The difficulty for an accrediting body, if a CI process is to be replaced by an audit process, is to be re-assured when surveying an HCO that information from an audit would be:

- Made available at the time of the survey
- Current
- Inclusive of relevant providers in the HCO being surveyed
- Cover the majority of the procedures performed in a particular timeframe
- Contain morbidity and mortality data relevant to the HCO
- Enable comparative (with peer HCOs) data review

A second challenge is to ensure that the ACHS CIP remains a requisite for ensuring a high quality of patient care, as clinical performance measures are developed by various other healthcare authorities.

In 1995 the Quality in Australian Health Care study (QAHCS) by Wilson *et al.* was published in the Medical Journal of Australia.⁴ Applying Brennan's Harvard Medical Practice Study to Australian hospitals they reported a rate of 16.6% for adverse events (AEs) in contrast to a rate of 3.7% in the American study. There was much comment in the press and in the medical community, heightened by a further study in the UK by Vincent *et al.* which reported an AE rate of 10.8%⁵, providing further apparent evidence of poor clinical practice in Australian hospitals.

What should have been noted was that the mortality rates from the AEs in each study were in the reverse order, being highest in the USA at 13.6%, 8% in the UK and 4.9% in Australia.⁶ These results when plotted on a graph provide an almost straight line. This suggests that there was a methodological difference in the determination of the threshold for AEs, with a high threshold providing smaller numbers of serious events and a low threshold

providing higher numbers of minor events, in which case the Australian hospital standards may have been no worse than those in the USA or the UK. Two subsequent papers appeared to verify this.

A comparison of iatrogenic injury studies in Australia and the USA was made using the QAHCS and a further American study by Thomas *et al.* in Utah and Colorado (UTCOS study), which also used the Harvard Medical Practice model.⁷ Five methodological differences were noted between the two studies and after application of the USA criteria to the Australian index admissions the number of records with AEs was reduced by 90%. Nevertheless the re-analysis still found a threefold higher rate of AEs in Australian hospitals, leaving the possible conclusion that in Australian hospitals the quality of care was inferior.⁸

However a further study by Runciman *et al.* comparing the same two iatrogenic injury studies between Australia and the USA, but looking at the reviewer behaviour and the quality of care, found a similar 2% rate of serious AEs in both studies, but more minor injuries in the Australian study.⁹ It was determined that there was a greater degree of under-reporting of certain types of problems as AEs, in the USA study. The biases were considered to be due to the quite different aims of the studies. Whereas the Australian study was designed to support improvement in patient care, with an incentive to identify as many AEs as possible, the UTCOS reviewers in the USA study may have been motivated to detect fewer AEs as that would lead to more affordable estimates of no-fault medical malpractice insurance. Runciman *et al.* concluded that no definitive difference in the quality of care was identified by their analysis or by a literature review.⁹ That Australian standards of care match those reported in the international literature can also be demonstrated using the ACHS CI data, where like measures have been used and published.³

Despite the above conclusions concerning the comparative studies the response to the publication of the Wilson *et al.* QAHCS paper was considerable. The Australian Council for Safety and Quality in Health Care was formed in 2000, with a budget of \$50 million for a five year program. From this program the Australian Commission on Safety and Quality in Health care (ACSQHC) was established in 2006. Since then a National Health Performance Authority has been created and the role of the ACSQHC has been extended to include the development of national clinical safety and quality standards¹⁰, while a set of hospital-based outcome CIs has been established, addressing in-hospital mortality, readmissions and hospital acquired infection. Much of the information for these CIs can be obtained from administrative data, although the unexpected nature of an unplanned readmission may not be evident from those sources.

Credit should go to Wilson *et al.* for having stimulated greater interest and funding in the pursuit of the measurement of the quality of care delivered in Australian healthcare facilities. It is for the healthcare facilities to determine which clinical performance measures it is obligatory to address and which measures they can choose to address in an endeavour to maintain and improve the quality and safety of the care they provide.

The plethora of standards and measures which have followed the QAHCS publication, the extensive coverage of clinical activities reflected in the ACHS CI sets, and the important provider input in their development and revision should ensure their continued use and influence in assessing standards of care in Australian healthcare facilities and, most importantly, in providing a stimulus to improvement in that care. Brand *et al.*, reporting on a survey of Australian public hospitals conducted in 2005, found that 99% of the hospitals surveyed measured clinical performance, with 72% using CIs to do so.¹¹ Presumably the majority of the CIs used at that time were from the ACHS program. It is surprising therefore that in a relatively recent article by Evans *et al.*, on clinical-quality registries, no mention was made of the ACHS national clinical database¹², and only a brief reference to ACHS CIs was made in an MJA supplement in 2010 devoted to the gathering of clinical information to improve care.¹³ There is clearly a challenge for ACHS in the promotion of its unique national clinical database.

References

1. Australian Council on Healthcare Standards (ACHS). Australasian Clinical Indicator Report. 2005-12. 14th Edition. Sydney, NSW; ACHS; 2013
2. Collopy BT. Clinical indicators in accreditation: an effective stimulus to improve patient care. *Int J Qual Health Care.* 2000; 12: 211-16
3. Collopy BT, Bichel-Findlay JM, Woodruff PWH, Gibberd RW. Clinical Indicators in surgery: a critical review of the Australian experience. *ANZ J Surg.* 2014; 84: 42-6
4. Wilson RM, Runciman WB, Gibberd RW, *et al.* The quality in Australian Health care study. *Med J Aust.* 1995; 163: 458-71
5. Vincent C, Neale G, Woloshynowych M. Adverse events in British hospitals: preliminary retrospective audit. *BMJ.* 2001; 322: 517-9
6. Collopy BT, McDonald IG. Threshold used for determining adverse events is important. *BMJ.* 2001; 322: 1426
7. Thomas EJ, Studdert DM, Burstin HR *et al.* Incidence and types of adverse events and negligence care in Utah and Colorado. *Med Care.* 2000; 38: 261-71
8. Thomas EJ, Studdert DM, Runciman WB, *et al.* A comparison of iatrogenic injury studies in Australia and the USA I: context, methods, casemix, population, patient and hospital characteristics. *Int J Qual Health Care.* 2000; 12: 371-8
9. Runciman WB, Webb RK, Helps SC, *et al.* A comparison of iatrogenic injury studies in Australia and the USA II: reviewer behaviour and quality care. *Int J Qual Health Care* 2000; 12: 379-88
10. Australian Commission on Safety and Quality in Health Care. Windows into safety and quality in health care. 2009. Sydney, NSW: ACSQHC; 2009
11. Brand CA, Tropea J, Ibrahim JE, *et al.* Measurement for improvement: a survey of current practice in Australian public hospitals. *Med J Aust.* 2008; 189: 35-40
12. Evans SM, Scott IA, Johnson NP, *et al.* Development of clinical-quality registries in Australia: the way forward. *Med J Aust.* 2011; 194: 360-3
13. Johnson NP, Board N (co-ordinating editors). Using what we gather-information for improved care. *Med J Aust.* 2010; 193: S89-S120

The Clinical Indicator Program: Key Facts 2013

Overview

In this edition there are a total of 338 Clinical Indicators (CIs) in 22 sets. The report includes data from both the public and private sectors, and from metropolitan and non-metropolitan healthcare organisations (HCOs). The report also includes data from New Zealand (NZ) alongside a national perspective of Australia, with the inclusion of all Australian states and territories.

Clinical Indicators and Submissions

Between 2006 and 2012, the number of HCOs participating in the Clinical Indicator Program (CIP) has been relatively stable, ranging from 665 to 690. However, the number of HCOs participating in the Infection Control CIs increased by 90, from 334 in 2012 to 424 in 2013, and the number of HCOs contributing to any CI increased by 61 to a total of 731. In 2013, the total number of six-monthly reports was 32,895 with similar numbers from the private and public sectors, 15,597 and 17,298, respectively.

Participants can submit their data monthly, three-monthly or six-monthly. Submission is voluntary, and some organisations submit intermittently. Most organisations make two submissions to each of their selected CIs in a year. The data are analysed and reports prepared every six months.

In 2006, the number of six-monthly data submissions was 35,413, and submissions reached a peak of 37,022 in 2009.

Table 1 gives the number of CIs and sets and, by sector, the number of reporting HCOs and the number of six-monthly CI data submissions.

Table 1: Number of indicator sets, indicators, number HCOs reporting and submissions 2006 to 2013

	2006	2007	2008	2009	2010	2011	2012	2013	Change from 2006
Clinical Indicator Sets	23	23	23	23	22	22	22	22	
Clinical Indicators	331	361	366	370	332	353	335	338	2%
Reporting HCOs									
Private	342	350	337	321	329	330	329	316	-8%
Public	339	339	352	350	336	360	341	415	22%
Total	681	689	689	671	665	690	670	731	7%
Submissions									
Private	16,586	17,005	17,645	17,881	17,193	16,732	16,539	15,597	-6%
Public	18,827	18,476	18,445	19,141	18,645	18,426	18,354	17,298	-8%
Total	35,413	35,481	36,090	37,022	35,838	35,158	34,893	32,895	-7%

* CI data are submitted every six months. Most HCOs submit data twice a year, however some submit data for one half of the year only.

HCOs reporting

While in previous years there were similar numbers of public and private HCOs reporting, in 2013 there were more public than private HCOs reporting, 415 and 316, respectively. **Table 2** shows the geographic location of the HCOs. There were 413 metropolitan HCOs and 318 non-metropolitan HCOs participating in the CIP.

Table 2: Number of HCOs reporting by location and public / private sector in 2013

State	Private	Public	Total
New South Wales	125	193	318
Victoria	62	84	146
Queensland	66	55	121
South Australia	24	27	51
Western Australia	18	41	59
Tasmania	9	3	12
Australian Capital Territory	7	3	10
New Zealand	4	5	9
Northern Territory	1	4	5
Total	316	415	731*

* 741 HCOs submitted data, however 10 HCOs were unable to validate their outlier data and were excluded

Clinical Indicators reported by each hospital

In 2013, the average number of individual CIs reported was 25.8, with 80% of HCOs reporting between 2 and 58 CIs. Half of all HCOs reported between eight and 37 CIs (25th and 75th centiles). The variation in number of CIs reported is mostly due to the nature of the hospital. For example, not all hospitals have EDs, ICUs, obstetrics, paediatrics or other specialties.

Since 2009 there has been a decrease in the mean and median number of CIs collected by individual HCOs in each year. The median number of CI sets that a HCO reported in each year was four between 2004 and 2012, and three in 2013. The median number of CIs collected increased from 20 in 2001 to 23 in 2010, was 21 in 2012 and 19 in 2013. The mean number of CIs collected increased from 21 in 2001 to 31 in 2009, and was 25.8 in 2013.

Table 3 shows that in 2013 there were seven CI sets with more than 150 HCOs providing data. While there are six CI sets where fewer than 50 hospitals contribute, a small number of hospitals may still provide a representative sample of all hospitals in Australia and New Zealand for some CIs. However, from a quality improvement perspective, it means that these HCOs have less data from which to determine whether the clinical areas in these sets could potentially improve their performance.

Table 3: HCOs providing data for one or more indicators within each indicator set, 2006–2013

Clinical Indicator Set	2006	2007	2008	2009	2010	2011	2012	2013
Anaesthesia	333	330	308	295	288	292	288	273
Day Patient†	415	427	400	392	397	393	370	337
Emergency Medicine	217	209	211	210	196	195	181	174
Gastrointestinal Endoscopy†	68	81	86	88	103	95	91	77
Gynaecology	123	88	90	84	82	78	65	58
Hospital in the Home	45	46	48	48	50	40	37	39
Hospital-Wide†	433	465	460	454	458	481	478	466
Infection Control	265	284	320	325	306	324	334	424
Intensive Care†	104	101	104	105	105	98	104	102
Internal Medicine	134	124	110	98	81	84	74	62
Medication Safety#	159	172	174	176	164	284	259	260
Mental Health Community Based	32	23	28	28	21	21	15	16
Mental Health Inpatient	121	124	121	124	112	107	110	103
Obstetrics†	212	210	180	181	187	186	188	184
Ophthalmology†	100	104	99	86	87	86	77	72
Oral Health	15	10	14	11	12	15	15	14
Paediatrics†	53	53	53	49	46	47	40	37
Pathology	41	45	37	49	42	42	42	40
Radiation Oncology	14	16	18	20	17	18	20	17
Radiology	65	67	65	66	60	60	69	64
Rehabilitation Medicine	107	114	109	112	122	126	122	115
Surgical	209	200	192	176	167	168	152	132
Any Indicator	681	689	689	671	665	690	670	731

Formerly “Adverse Drug Reactions”

† Revised indicator set introduced.

Clinical Indicator Trends and Variation

Revealing the potential to improve performance

For an individual facility, fluctuations in performance compared to the overall performance of all submitting organisations may highlight areas for further investigation.

From a health system perspective, the goal would be to see an overall trend in the desirable direction. For the majority of CIs which are process-based, a decrease in variation between the best performing organisations and the remainder would demonstrate improvement across the system.

Using trends and variation from a systems perspective

The full Australasian Clinical Indicator Report shows the trends in the rates for each CI (if four or more years of data are available), and three measures of the variation in rates between HCOs. The variations in clinical practice are quantified by the differences between the 20th and 80th centiles, the differences between the strata, and the rates for the HCOs that are outliers.

The report also estimates the potential improvement in outcomes if:

- the mean rate was shifted to the better centile rate,
- the mean rate was shifted to the best stratum rate, and
- outlier HCOs with less desirable rates were to shift their rate to the mean rate.

This is calculated for each year and is reported using tables and graphs. The text that summarises the results is divided, where appropriate, into:

- a summary of the trends in the mean rates and centiles,
- a table of the differences in the strata rates if they are statistically significant, and
- the number of outlier HCOs.

To view the results in full and for more information on the methodology used in this report, refer to the documentation available on the ACHS website (www.achs.org.au/publications-resources/australasian-clinical-indicator-report/) located with this summary report.

Clinical Indicator Trends 2006 – 2013

Of the 338 CIs collected in 2013, 328 are rate-based CIs, of which 316 had a desirable direction specified (high or low rates indicating better care). Trends could be analysed for 238 of the rate-based CIs. CIs were not analysed for trends if there were less than four years of data, no desirable direction or less than five HCOs reporting. There were 16 sets which had more CIs moving in the desirable direction than in the undesirable direction. Eleven CI sets had at least two-thirds of all trended CIs improve: Day Surgery, Emergency Medicine, Gynaecology, Infection Control, Intensive Care, Internal Medicine, Medication Safety, Mental Health Inpatient, Ophthalmology, Paediatric and Radiation Oncology.

Since trends can be due to a changing mix of contributing HCOs, the CIs were tested again to determine whether each trend remained statistically significant after allowing for changes in the HCOs submitting data. Of those 122 statistically significant trends in the desirable direction, 93 remained significant after allowing for changes in the HCOs submitting, and of those 49 CIs whose trends were deteriorating, 23 remained significant.

Sixty-seven CIs showed no statistically significant trend, although non-significant trends were seen. The trend results are summarised in **Table 4**.

Table 4: Summary of the trends by indicator set: CIs that have statistically significant ($p < 0.05$) trends[†] in the desirable, undesirable direction

Clinical Indicator Set	Number of CIs*	Number analysed	Desirable trend‡	Undesirable trend‡	No Trend
Anaesthesia	16	16	7 (1)	8 (3)	1
Day Patient	14	5	3 (0)	1 (0)	1
Emergency Medicine	20	7	6 (5)	1 (1)	0
Gastrointestinal Endoscopy	11	5	2 (1)	0 (0)	3
Gynaecology	13	13	6 (6)	0 (0)	7
Hospital in the Home	8	5	2 (0)	1 (1)	2
Hospital-Wide	15	14	9 (6)	5 (2)	0
Infection Control	43	30	19 (21)	0 (4)	11
Intensive Care	16	8	7 (4)	0 (0)	1
Internal Medicine	30	11	5 (3)	2 (1)	4
Medication Safety	10	8	4 (4)	1 (1)	3
Mental Health Community Based	6	4	0 (0)	1 (0)	3
Mental Health Inpatient	28	28	19 (16)	6 (2)	3
Obstetrics	21	18	5 (3)	10 (5)	3
Ophthalmology	14	11	4 (3)	1 (1)	6
Oral Health	10	1	1 (0)	0 (0)	0
Paediatrics	12	3	3 (0)	0 (0)	0
Pathology	11	11	5 (4)	5 (1)	1
Radiation Oncology	10	10	8 (5)	1 (0)	1
Radiology	5	5	3 (3)	1 (0)	1
Rehabilitation Medicine	6	6	2 (2)	2 (0)	2
Surgical	19	19	2 (6)	3 (1)	14
Total	338	238	122 (93)	49 (23)	67
Percent of tested		100%	51% (39%)	21% (10%)	28%

† Trends are not reported for CIs with less than four years' of data, or fewer than five HCOs reporting, and only where the desirable rate is specified as either high or low.

* Includes only rate-based CIs where the desired rate is specified as either high or low.

‡ The number in brackets is the number of CIs that had statistically significant trends after allowing for changes in the HCOs contributing the data.

Variation in Clinical Indicator rates

Using odds ratios from the centiles

Given that HCOs may be large or small, there is a need to control for the differences in the random variations or confidence intervals for each HCO. To this end, 'shrunk rates' are used. The standard deviations of these 'shrunk rates' could be presented as a measure of variation between HCOs. These distributions are not symmetrical so the 20th and 80th centiles are reported. The region between these centiles contains the 'shrunk rates' for 60% of hospitals and the difference between the 20th and 80th centiles is approximately twice the standard deviation of the rates.

One measure that can be derived from the centiles is the odds ratio (OR) of having an event when the poorer rate applies compared to when the better rate applies. The odds ratio is used to select CIs where there is large systematic variation in rates. If the better rate is the 80th centile, then the odds ratio is the ratio between the odds for the 80th centile and the odds for the 20th centile rates, $R(80)$ and $R(20)$. The formula is as follows:

$$OR = \frac{R(80)}{1-R(80)} \times \frac{1-R(20)}{R(20)}$$

While the formula may appear somewhat daunting, the interpretation is clear. Greater values in the odds ratio indicate greater systematic variation in rates for a given CI, and it may be appropriate to determine the causes of these variations.

Table 5 shows that there are 88 CIs (28% of those tested) with high odds ratios (≥ 10) in 17 sets, and four sets with over half the CIs having high odds ratios.

Table 5: Odds ratios for CIs in each set – a high odds ratio reveals high systemic variation

Clinical Indicator Set	Number of CIs	CIs tested*	OR: 1 to <2	OR: 2 to <10	OR: ≥ 10	% ≥ 10
Anaesthesia	16	16	0	3	13	81
Day Patient	14	14	0	4	10	71
Emergency Medicine	20	19	3	10	6	32
Gastrointestinal Endoscopy	11	11	5	3	3	27
Gynaecology	13	13	7	5	1	8
Hospital in the Home	8	8	2	6	0	0
Hospital-Wide	15	15	1	10	4	27
Infection Control	43	38	26	9	3	8
Intensive Care	16	15	2	7	6	40
Internal Medicine	30	27	13	7	7	26
Medication Safety	10	9	2	4	3	33
Mental Health Community Based	6	6	0	1	5	83
Mental Health Inpatient	28	27	5	11	11	41
Obstetrics	21	21	9	8	4	19
Ophthalmology	14	11	2	8	1	9
Oral Health	10	10	2	8	0	0
Paediatrics	12	9	4	4	1	11
Pathology	11	11	0	9	2	18
Radiation Oncology	10	10	1	6	3	30
Radiology	5	5	0	4	1	20
Rehabilitation Medicine	6	6	0	2	4	67
Surgical	19	15	9	6	0	0
Total	338	316	93	135	88	
Percent of tested		100	29	43	28	

* The odds ratio can only be calculated where the centile is not zero or 100%.

Clinical Indicators with significant variations between strata

For each CI, the detailed results identify whether there were statistically different mean rates for 2013 between the three strata: Australian states and territories and NZ, public / private, and metropolitan / non-metropolitan. This section summarises those results, by identifying the stratum that explains most of the variation in 2013. **Table 6** shows the number of CIs that were analysed, and how many had significant stratum differences by CI set.

Table 6: Number of indicators whose mean rates were statistically significantly different by Australian state / NZ, public / private, metropolitan / non-metropolitan, 2013

Clinical Indicator Set	Number of CIs	CIs tested [#]	State / NZ	Public / private	Metropolitan / non metropolitan
Anaesthesia	16	14	7	6	0
Day Patient	14	14	2	3	1
Emergency Medicine	20	11	6	0	2
Gastrointestinal Endoscopy	11	10	4	3	0
Gynaecology	13	10	0	1	0
Hospital in the Home	8	6	2	0	1
Hospital-Wide	15	15	5	5	0
Infection Control	43	28	10	5	2
Intensive Care	16	13	7	7	1
Internal Medicine	30	9	2	1	0
Medication Safety	10	7	2	5	3
Mental Health Community Based	6	1	0	0	0
Mental Health Inpatient	28	27	8	7	0
Obstetrics	21	20	10	11	1
Ophthalmology	14	10	3	5	0
Oral Health	10	3	2	0	0
Paediatrics	12	3	2	0	1
Pathology	11	11	6	0	1
Radiation Oncology	10	6	1	0	0
Radiology	5	5	2	0	0
Rehabilitation Medicine	6	6	1	4	0
Surgical	19	15	1	2	0
Total	338	244	83	65	13
Percent of tested		100%	34%	27%	5%

[#] At least 10 HCOs must submit for the CI to be tested.

There were 83 CIs with significant differences in mean rates between states and territories of Australia / NZ with most occurring in Infection Control (10), Mental Health Inpatient (8), Obstetrics (10) and Pathology (6). This is similar to the result from 2012. Significant differences between the mean rates for the public and private strata were found in 65 CIs, with most being in Obstetrics (11), Mental Health Inpatient (7) and Intensive Care (7). There were 13 CIs with significant differences between metropolitan and non-metropolitan participants.

Outliers

Clinical Indicators and HCOs with significantly different rates

The reporting of HCOs that are outliers is more relevant to the individual HCOs. Participating HCOs receive reports identifying those areas where their rates are significantly different from those of other HCOs. Outliers are summarised in this publication to show that they occur in all sets, and in sufficiently large numbers to suggest that all HCOs would benefit from reviewing their results.

This section uses the data for 2013 to identify desirable and less desirable rates. If a shrunken rate was more than three standard errors from the overall rate, this was considered to be statistically significant. These rates are called outliers.

Of the 335 rate-based CIs (with rates between 0 and 100%) and 35,158 six-monthly data submissions, those CIs with no preferred direction or those CIs that had a total of less than 20 six-monthly data submissions in 2013 were excluded. There remained 218 CIs and 32,751 individual data submissions.

For the 226 rate-based CIs that had a desirable direction and more than 20 six-monthly data submissions, a summary of the number of outlier data submissions is given in **Table 7**. The proportion of data submissions that were outliers with a desirable direction was 14%, the proportion with a less desirable rate was 10%, and the remaining 76% of submissions were not outliers. These proportions varied between the specialties.

More than 15% of six-monthly data submissions in the Emergency Medicine, Intensive Care, Pathology and Rehabilitation Medicine CI sets were statistically significant in the undesirable direction. Three of these four CI sets had a greater number of six-monthly data submissions in the favourable direction than in the unfavourable direction.

Table 7: The proportions of outlier data submissions in 2013

Clinical Indicator Set	Number of CIs	CIs tested#	HCOs	Data submission	% Poorer	% Better
Anaesthesia	16	12	273	2,283	13%	36%
Day Surgery	14	14	337	3,228	11%	13%
Emergency Medicine	20	11	174	1,815	20%	44%
Gastrointestinal Endoscopy	11	9	77	638	2%	0%
Gynaecology	13	10	56	536	10%	1%
Hospital in the Home	8	6	36	274	10%	3%
Hospital-Wide	15	15	466	5,299	14%	15%
Infection Control	43	25	424	4,155	2%	0%
Intensive Care	16	13	100	1,253	18%	28%
Internal Medicine	30	5	37	119	7%	2%
Medication Safety	10	7	247	713	10%	5%
Mental Health Community Based	6					
Mental Health Inpatient	28	25	103	2,423	13%	15%
Obstetrics	21	20	184	4,626	6%	6%
Ophthalmology	14	8	72	502	5%	0%
Oral Health	10	3	13	67	12%	13%
Paediatrics	12	3	36	101	10%	7%
Pathology	11	9	40	404	23%	34%
Radiation Oncology	10	5	17	120	8%	8%
Radiology	5	5	64	306	14%	16%
Rehabilitation Medicine	6	6	115	1,201	19%	14%
Surgical	19	15	131	805	1%	1%
Total	338	226	731	30,868	10%	14%

There must be at least 20 six-monthly data submissions for the CI to be tested

Those CIs with a high proportion of outliers were usually associated with process measures, such as access block in emergency departments and intensive care units, delays in reporting test results in pathology, and documentation of processes in rehabilitation medicine and intensive care.

Each of the 226 CIs tested was categorised according to whether there were:

- no outlier six-monthly data submissions
- at least one outlier with undesirable rates, none with desirable rates
- at least one outlier with desirable rates, none with undesirable rates, and
- outliers with both desirable and undesirable rates.

Table 8 reveals that 42 of the 226 CIs had no six-monthly data submissions that were outliers and 125 CIs included both poorer and better six-monthly data submissions as outliers.

Table 8: Number of indicators that had six-monthly data submissions that were outliers in 2013*

Outlier category	Number of CIs	Percent of CIs	Data submissions		
			Range	Median	Mean
No outliers	42	19	20 – 291	42	67
Undesirable rates only	57	25	21 – 673	83	129
Desirable rates only	2	1	21 – 53	37	37
Outliers – both	125	55	20 – 714	107	165
Total	226	100	20 – 714	79	137

* CIs with no preferred direction or less than 20 six-monthly data submissions were excluded

Can outlier rates be used to rank HCOs?

This has been suggested as a way to improve quality, even though the research literature, in general, does not support the use of 'league tables'.

For the 42 CIs with no outliers, the variation between HCOs was not statistically significant. This means that any ranking would be equivalent to that obtained from tossing a coin or a dice. For the remaining 184 CIs, 182 (81% of the 226 tested) have six-monthly data submissions that are outliers in the undesirable direction (with or without other outlier submissions in the desirable direction) (**Table 8**).

Each of the 728 HCOs that submitted one or more of 226 CIs tested was categorised according to whether there were:

- no outlier data submissions
- at least one outlier with undesirable rates, none with desirable rates
- at least one outlier with desirable rates, none with undesirable rates
- outliers with both desirable and undesirable rates.

The analyses of the outlier rates by HCO reveal that the desirable rates do not cluster into HCOs that have better performance, but that both desirable and undesirable rates occur in 53% of HCOs (**Table 9**). Furthermore, the table shows that HCOs that report fewer CIs (mean of nine six-monthly data submissions and five CIs) have less likelihood of having both desirable and undesirable rates compared to those reporting a greater number of CIs (mean of 64 six-monthly data submissions and 36 CIs).

Table 9: Number of HCOs that had indicators that were outliers, year 2013*

Outlier category	Number of HCOs	Percent of HCOs	Number of CIs			Data submissions		
			Range	Median	Mean	Range	Median	Mean
No outliers	146	20	1 – 41	2	5	2 – 58	4	9
Undesirable rates only	83	11	1 – 45	11	12	2 – 78	18	21
Desirable rates only	113	16	1 – 44	16	17	1 – 88	27	29
Outliers – both	386	53	3 – 138	31	36	6 – 245	55	64
Total	728	100	1 – 138	18	24	1 – 245	31	42

* CIs with no preferred direction or less than 20 six-monthly data submissions were excluded

These results show that:

- for each CI, the majority of six-monthly data submissions (76%) are not statistically different from the average (**Table 7**)
- most HCOs (80%) have some clinical areas with rates that are outliers (**Table 9**).

This suggests that CIs have a greater role in identifying areas for review, rather than for ranking performance.

Summary of Results

This 15th edition of the Australasian Clinical Indicator Report (ACIR) 2006-2013 provides an overview of the analysis of each Clinical Indicator (CI) set for the last eight years (for longer standing CIs), with additional commentary from the collaborating specialist healthcare colleges, societies and associations. This expertise provides context for any trends or variation observed in the data. Detailed information about each CI is available from the ACHS website, www.achs.org.au/programs-services/clinical-indicator-program/.

Retrospective data and charts for every CI collected in 2013 can be accessed under the tabs at the base of the ACIR page on the ACHS website, or by scanning the QR within the contents page with a smart phone or device.

A summary of the main observations for each set of CIs follows.

	Anaesthesia, version 5.1	23		Mental Health Community Based, version 2	76
	Day Patient, version 5	27		Mental Health Inpatient, version 6	80
	Emergency Medicine, version 5.1	32		Obstetrics, version 7.2	90
	Gastrointestinal Endoscopy, version 2	37		Ophthalmology, version 5	100
	Gynaecology, version 6	41		Oral Health, version 3	104
	Hospital in the Home, version 4	44		Paediatrics, version 4.1	107
	Hospital-Wide, version 11.2	47		Pathology, version 3	110
	Infection Control, version 3.1	54		Radiation Oncology, version 3	113
	Intensive Care, version 4.1	59		Radiology, version 4	118
	Internal Medicine, version 5	70		Rehabilitation Medicine, version 5	122
	Medication Safety, version 3	73		Surgical, version 3	124



Anaesthesia

VERSION 5.1

Pre-anaesthesia period

CI 1.1 Adequate pre-anaesthesia assessment of the surgical patient (H) In 2013, there were 136,876 patients reported from 59 HCOs. The annual rate was 97.9 per 100 patients. The fitted rate deteriorated from 97.6 to 97.4, a change of 0.25 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were five outlier records from four HCOs whose combined excess was 2,406 fewer patients having a documented pre-anaesthesia assessment. The outlier HCO rate was 81.1 per 100 patients.

CI 1.2 Documentation of risks and benefits of anaesthesia (H) In 2013, there were 58,805 patients reported from 36 HCOs. The annual rate was 95.3 per 100 patients. The fitted rate deteriorated from 92.1 to 91.5, a change of 0.66 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were seven outlier records from four HCOs whose combined excess was 2,126 fewer patients who had documentation of risks and benefits. The outlier HCO rate was 69.7 per 100 patients.

CI 1.3 History of PONV – prophylactic anti-emetic administered (H) In 2013, there were 2,136 patients reported from 11 HCOs. The annual rate was 98.7 per 100 patients. The fitted rate deteriorated from 91.3 to 87.1, a change of 4.3 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were two outlier records from one HCO whose combined excess was 20 fewer patients to whom a prophylactic anti-emetic had been administered. The outlier HCO rate was 72.3 per 100 patients.

Intra-operative period

CI 2.1 Presence of a trained assistant (H) In 2013, there were 180,507 patients reported from 38 HCOs. The annual rate was 92.7 per 100 patients. The fitted rate deteriorated from 98.0 to 92.7, a change of 5.3 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 5.8 per 100 patients. In 2013, the potential gains totalled 13,113 more procedures where there is a trained assistant to the anaesthetist. There were ten outlier records from five HCOs whose combined excess was 9,946 fewer procedures where there was a trained assistant to the anaesthetist. The outlier HCO rate was 68.4 per 100 patients.

CI 2.2 Anaesthesia records – compliance with the ANZCA requirements (H) In 2013, there were 162,812 patients reported from 61 HCOs. The annual rate was 97.8 per 100 patients. The fitted rate improved from 93.4 to 98.0, a change of 4.6 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 4.5 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were 13 outlier records from 11 HCOs whose combined excess was 2,506 fewer compliant anaesthesia records. The outlier HCO rate was 88.7 per 100 patients.

Patient recovery period

CI 3.1 Avoiding severe respiratory distress in the recovery room (L) In 2013, there were 1,394,738 patients reported from 213 HCOs. The annual rate was 0.047 per 100 patients. The fitted rate improved from 0.061 to 0.052, a change of 0.009 per 100 patients. The potential gains totalled 573 fewer patients who required intervention to relieve respiratory distress, corresponding to a reduction by approximately four-fifths. There were 21 outlier records from 17 HCOs whose combined excess was 319 more patients who required intervention to relieve respiratory distress. The outlier HCO rate was 0.47 per 100 patients.

CI 3.2 Recovery – PONV treatment according to approved protocol (L) In 2013, there were 705,765 patients reported from 125 HCOs. The annual rate was 0.83 per 100 patients. The fitted rate improved from 1.3 to 0.75, a change of 0.52 per 100 patients. The potential gains totalled 5,600 fewer patients undergoing treatment for post-operative nausea and vomiting, corresponding to a reduction by approximately four-fifths. There were 46 outlier records from 33 HCOs whose combined excess was 3,657 more patients undergoing treatment for post-operative nausea and vomiting. The outlier HCO rate was 3.2 per 100 patients.

CI 3.3 Inadvertent hypothermia after surgery (L) In 2013, there were 1,060,448 patients reported from 181 HCOs. The annual rate was 1.9 per 100 patients. The fitted rate deteriorated from 0.95 to 2.4, a change of 1.5 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.5 per 100 patients. In 2013, the potential gains totalled 20,394 fewer patients with a temperature of less than 36 degrees, corresponding to a reduction by approximately four-fifths. There were 58 outlier records from 38 HCOs whose combined excess was 14,571 more patients with a temperature of less than 36 degrees. The outlier HCO rate was 9.6 per 100 patients.



CI 3.4 Recovery – severe pain not responding to protocol, anaesthetist review (L) In 2013, there were 1,390,822 patients reported from 214 HCOs. The annual rate was 0.38 per 100 patients. The fitted rate improved from 0.44 to 0.37, a change of 0.072 per 100 patients. The potential gains totalled 4,591 fewer patients who had severe pain not responding to pain protocol, corresponding to a reduction by approximately four-fifths. There were 55 outlier records from 38 HCOs whose combined excess was 2,419 more patients who had severe pain not responding to pain protocol. The outlier HCO rate was 1.5 per 100 patients.

CI 3.5 Unplanned recovery room stay of longer than 2 hours for medical reasons (L) In 2013, there were 1,154,597 patients reported from 198 HCOs. The annual rate was 1.2 per 100 patients. The fitted rate deteriorated from 0.93 to 1.1, a change of 0.14 per 100 patients. The potential gains totalled 12,311 fewer patients who had an unplanned stay of longer than two hours, corresponding to a reduction by approximately four-fifths. There were 42 outlier records from 31 HCOs whose combined excess was 6,915 more patients who had an unplanned stay of longer than 2 hours. The outlier HCO rate was 5.3 per 100 patients.

Post-operative period

CI 4.1 Unplanned admission to the ICU within 24 hours of a procedure (L) In 2013, there were 846,076 patients reported from 115 HCOs. The annual rate was 0.19 per 100 patients. The fitted rate deteriorated from 0.17 to 0.20, a change of 0.022 per 100 patients. The potential gains totalled 1,417 fewer patients having an unplanned admission to ICU within 24 hours of a procedure, corresponding to a reduction by approximately four-fifths. There were 23 outlier records from 15 HCOs whose combined excess was 660 more patients having an unplanned admission to ICU within 24 hours of a procedure. The outlier HCO rate was 0.66 per 100 patients.

Acute pain management

CI 5.1 Measurement and documentation of pain intensity scores after major surgery (H) In 2013, there were 18,682 patients reported from 17 HCOs. The annual rate was 96.1 per 100 patients. The fitted rate improved from 95.1 to 95.8, a change of 0.68 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were seven outlier records from five HCOs whose combined excess was 466 fewer surgical patients having pain intensity scores recorded. The outlier HCO rate was 85.4 per 100 patients.

CI 5.2 Daily anaesthetist review after post-operative epidural analgesia (H) In 2013, there were 617 patients reported from 10 HCOs. The annual rate was 97.6 per 100 patients. The fitted rate deteriorated from 99.9 to 97.3, a change of 2.5 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There was one outlier record from one HCO whose combined excess was 10 fewer patients reviewed daily. The outlier HCO rate was 80.3 per 100 patients.

Obstetric anaesthesia care

CI 6.1 Minimisation of post-dural puncture headache (L) In 2013, there were 9,077 patients reported from 17 HCOs. The annual rate was 0.74 per 100 patients. The fitted rate deteriorated from 0.33 to 0.64, a change of 0.31 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.31 per 100 patients. In 2013, the potential gains totalled 35 fewer obstetric patients who experienced a post-dural puncture headache, corresponding to a reduction by approximately one-half. There was one outlier record from one HCO whose combined excess was eight more obstetric patients who experienced a post-dural puncture headache. The outlier HCO rate was 1.8 per 100 patients.

CI 6.2 Obstetrics – surgery within 30 minutes of lower section caesarean section (LSCS) request (H) In 2013, there were 650 patients reported from eight HCOs. The annual rate was 92.6 per 100 patients. The fitted rate improved from 82.3 to 95.8, a change of 13.5 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were five outlier records from four HCOs whose combined excess was 36 fewer caesarean section patients who commenced surgery within 30 minutes. The outlier HCO rate was 25.0 per 100 patients.

CI 6.3 Obstetric patients with risks and benefits of analgesia documented (H) In 2013, there were 2,415 patients reported from eight HCOs. The annual rate was 81.2 per 100 patients. The fitted rate improved from 63.5 to 86.0, a change of 22.6 per 100 patients. The potential gains totalled 447 more obstetric patients who had documentation of risks and benefits. There were three outlier records from three HCOs whose combined excess was 233 fewer obstetric patients who had documentation of risks and benefits. The outlier HCO rate was 59.0 per 100 patients.



Expert commentary

Australian and New Zealand College of Anaesthetists (ANZCA)

Introductory Comments

Whilst the validity of some of the Anaesthesia CI data is difficult to assess due to low HCO contribution, the more robust data provide a valuable insight into aspects of current anaesthetic practice. It allows HCOs and anaesthetists to benchmark themselves against others and may validate current clinical processes or stimulate reflection on possible methods for improvement.

Pre-anaesthesia period

Adequate pre-anaesthetic assessment of the surgical patient (**CI 1.1**) remains the cornerstone of good anaesthetic care. The rate of documentation of 97.7 % reflects this, but it should be 100%. The lower rate in public hospitals may reflect urgent immediate transfer of emergency cases to the operating suite. Inadequate pre-operative assessment is recognised as contributing to perioperative morbidity and mortality.¹

Although the overall rate of documentation of risks and benefits of anaesthesia (**CI 1.2**) has improved, it remains lower in Victoria. This is of concern and not easily explained. However, only six HCOs contributed data. More hospitals are requiring separate signed anaesthesia consent which should improve documentation of risks. Assessment of adequacy of documentation of risks is, however, subjective and also provides no information on adequacy of discussion of risks.

Approximately 98% of patients with a history of PONV (**CI 1.3**) were administered a prophylactic anti-emetic which reflects recognition of the importance of preventing PONV in providing patient satisfaction and aiding early discharge.²

Intra-operative period

The rise in the number of anaesthetists prepared to provide an anaesthetic service without a trained assistant in attendance is of great

concern (**CI 2.1**). In the nine HCOs reporting from Queensland, only 75% of anaesthetists had a trained assistant for procedures. This lack of trained staff was noted in the last report and has not improved. A trained anaesthetic assistant should always be present whenever any anaesthetic procedure is performed.³

Overall for **CI 2.2**, the rate of compliance with ANZCA requirements for adequate anaesthetic record keeping was high at 97.8%, although it was higher in private versus public hospitals. This may reflect more junior staff filling out records in public hospitals, with most consultant anaesthetists recognising the importance of clear and adequate documentation for future anaesthesia episodes and for medico-legal reasons.

Patient recovery period

The number of HCOs reporting **CI 3.1** is high, reflecting recognition of the importance of prevention and management of severe respiratory distress. On average 47 patients per 100,000 require significant intervention. Although the outlier rate was 0.47 per 100 (470/100,000) patients, this may reflect a more complex caseload and patient profile. Nevertheless, appropriate planning and management of such patients should ideally prevent the need for significant airway intervention in recovery.

In 2013, 0.83 per 100 patients received treatment for PONV according to hospital protocol (**CI 3.2**). PONV is recognised as a common complication following anaesthesia and surgery. This relatively low rate reflects both the use of prophylactic anti-emetics and the fact that many hospitals do not have defined protocols. The lower rate in private hospitals is possibly due to more liberal use of prophylactic therapy. Certain high-volume procedures that are infrequently associated with PONV, such as endoscopy, may also be contributing to the data.

In relation to inadvertent hypothermia after surgery (**CI 3.3**), many hospitals / anaesthetists have recognised the importance of preventing hypothermia and have adopted a comprehensive approach with pre-warming of patients, administration of warmed fluids and regular use of intra-operative warming devices. However, there seems to be significant regional variation in such practice. South Australia and Western Australia reported five patients per 100 with temperatures less than 36 degrees Celsius, compared to a national average of two per 100. The private sector seems to be leading the way in terms of hypothermia prevention. A concern for all HCOs is the well-recognised inaccuracy of non-invasive temperature measuring devices with many patients being documented as normothermic in the operating room, but hypothermic on reaching recovery.

The rate for **CI 3.4** of just under 4 patients per 1,000 requiring further management of pain beyond a pain protocol remains largely unchanged although the problem is more common in public versus private hospitals. This may reflect case-mix with more complex procedures in the public sector. The presence of trainees in public hospitals may also be a factor. On the face of it, this appears to be a significant underestimate of additional analgesia interventions and may be distorted by a large number of low-level procedures (e.g. endoscopy) being included.

In regard to the unplanned recovery room stay of longer than 2 hours for medical reasons (**CI 3.5**), despite the number of patients staying beyond 2 hours in recovery having increased slightly the rate of 1.2 per 100 patients is not unreasonable. Older and more complex patients are being accepted for surgery. It is more appropriate to manage and stabilise these patients in an environment with one-to-one nursing than to prematurely discharge such patients to the ward. It is important to maintain the differentiation between administrative and medical reasons for delay.



Post-operative period

The rate of unplanned admission to ICU within 24 hours of a procedure (CI 4.1) remains unchanged at about 2 per 1,000. Although there will always be unpredictable events such as anaphylaxis, anaesthetists should be encouraged to plan for ICU admission when cases are expected to be long and complex or finish in the late evening. A number of these cases are admitted for reasons related to surgical complexity / complications and not primarily anaesthesia causes. It is important to consider ward resources for managing complex cases.

Acute pain management

Only 17 HCOs reported on CI 5.1 and of those, 96% used a pain intensity scoring system. This should be encouraged although it assumes there is a mechanism in place for providing appropriate analgesia if required. Regular monitoring and assessment of analgesia must be done in conjunction with assessment for ventilator impairment, including sedation scoring.⁴

Similarly, there were only 18 records from only ten HCOs in 2013 that reported on CI 5.2 with a daily review rate of 97.6%. This is a slight fall in rate, but may reflect the fact that more hospitals have Acute Pain Services with review by experienced nurses. All patients with epidural analgesia infusions for acute pain management should be assessed daily.⁵

Obstetric anaesthesia care

It would be informative to have a breakdown of data from hospitals that have trainees performing obstetric epidurals compared to those that do not, as operator experience is by far the most important factor in dural puncture when epidurals are performed. The outlier rate for CI 6.1 of 1.8 per 100 patients would be consistent with a training institution and the literature. A rate of one in 100 is acceptable for trainees.

Only eight HCOs reported on CI 6.2 although in 92.6% of cases surgery was commenced within the specified 30 minutes. The outlier rate of only 25% is of great concern, but no details are available of the size or location of the four HCOs reporting such 'delays'. The time to commencement of surgery is dependent on a number of factors, not simply availability and skill of the anaesthetist.

Although only eight HCOs reported on CI 6.3, the demonstration that only 80% of patients had risks and benefits of epidural analgesia discussed reflects the difficulty in obtaining valid consent in labour. Incomplete documentation may also be due to deficiencies in the epidural chart itself. Ideally, such discussion and documentation would take place antenatally. Education should be relatively easy to achieve, however individual consent is logistically difficult.

General comments

Some of the most concerning data, as mentioned, relate to the lack of a trained anaesthetic assistant and particularly the regional variation in this practice. This was noted in the last report. It would be worthy of both College and Government attention as it may reflect a manpower issue.

Robust clinical governance is becoming ever more important to HCOs. Adequate documentation is being demanded of medical staff. An audit should reveal an improvement in such.

As part of ANZCA's new Continuing Professional Development Program, anaesthetists are encouraged to audit their practice. If an HCO were to embrace and encourage this, useful and accurate data could be derived regarding a particular CI.

Response rates

It is apparent that the response rate for each CI is largely unchanged compared to the previous year, despite the forthcoming implementation of the National

Standards. There remains very poor uptake of some CIs making useful comment about clinical practice pertaining to these difficult. In particular the obstetric CIs are very poorly represented and their inclusion should be reconsidered. The CI data derived from the recovery room are much more robust as these CIs are relatively easy to collect as well as being non-subjective. They also provide useful data which have the potential to change practice.

Unfortunately, some CIs are poorly utilised, but actually represent essential clinical practice, for example, presence of a trained assistant to the anaesthetist (CI 1.2).

Without mandating collection of certain CIs, it will remain difficult to draw conclusions about some data. However, some data collection, such as assessing whether documentation complies with College guidelines, requires significant skill and time commitment.

Quality improvement

Individual HCOs are able to benchmark their performance against others, although as the data are de-identified it is difficult to know whether institutions are comparable in size, geographic location, patient profile, etc. Most importantly, outlier HCOs need to consider how to implement changes that will potentially improve patient care.

References

1. Activities of the Special Committee Investigating Deaths Under Anaesthesia 2011-2012, Clinical Excellence Commission, NSW. www.cec.health.nsw.gov.au/programs/scidua
2. Consensus Guidelines for the Management of Postoperative Nausea and Vomiting Gan et al Anesth Analg 0214; 118:85-113
3. ANZCA Professional Document PS08: Recommendations on the Assistant for the Anaesthetist
4. Macintyre P, Loadsman J, Scott DA. Opioids, Ventilation and Acute Pain
5. ANZCA – PS41 Guidelines on Acute Pain Management



Day Patient

VERSION 5

Pre-admission preparation

CI 1.1 Booked patients assessed before admission

(H) In 2013, there were 66,977 patients reported from 50 HCOs. The annual rate was 86.1 per 100 patients. In 2013, the potential gains totalled 9,330 more patients who have a pre-admission assessment. There were eight outlier records from eight HCOs whose combined excess was 6,469 fewer patients who had a pre-admission assessment. The outlier HCO rate was 51.0 per 100 patients.

Procedure non-attendance

CI 2.1 Booked patients who fail to arrive (L) In 2013, there were 765,055 patients reported from 270 HCOs. The annual rate was 0.53 per 100 patients. The fitted rate improved from 0.90 to 0.69, a change of 0.22 per 100 patients. The potential gains totalled 3,816 fewer patients who failed to arrive, corresponding to a reduction by approximately four-fifths. There were 60 outlier records from 42 HCOs whose combined excess was 2,113 more patients who failed to arrive. The outlier HCO rate was 2.6 per 100 patients.

Procedure cancellation

CI 3.1 Cancellation after arrival – pre-existing medical condition (L) In 2013, there were 1,015,769 patients reported from 296 HCOs. The annual rate was 0.18 per 100 patients. The fitted rate deteriorated from 0.18 to 0.20, a change of 0.022 per 100 patients. The potential gains totalled 1,250 fewer patients who had a procedure cancelled, corresponding to a reduction by approximately two-thirds. There were 35 outlier records from 26 HCOs whose combined excess was 518 more patients who had a procedure cancelled. The outlier HCO rate was 1.2 per 100 patients.

CI 3.2 Cancellation after arrival – acute medical condition (L) In 2013, there were 1,005,753 patients reported from 294 HCOs. The annual rate was 0.26 per 100 patients. The fitted rate improved from 0.27 to 0.26, a change of 0.016 per 100 patients. The potential gains totalled 1,987 fewer patients who had a procedure cancelled, corresponding to a reduction by approximately three-quarters. There were 55 outlier records from 39 HCOs whose combined excess was 929 more patients who had a procedure cancelled. The outlier HCO rate was 1.5 per 100 patients.

CI 3.3 Cancellation after arrival – administrative / organisational reasons (L)

In 2013, there were 997,372 patients reported from 296 HCOs. The annual rate was 0.48 per 100 patients. The fitted rate improved from 0.64 to 0.54, a change of 0.092 per 100 patients. The potential gains totalled 4,351 fewer patients who had a procedure cancelled, corresponding to a reduction by approximately four-fifths. There were 81 outlier records from 58 HCOs whose combined excess was 2,546 more patients who had a procedure cancelled. The outlier HCO rate was 2.5 per 100 patients.

Episode of care adverse events

CI 4.1 Patients who experience an adverse event during care delivery (L)

In 2013, there were 97,656 patients reported from 67 HCOs. The annual rate was 0.15 per 100 patients. The potential gains totalled 112 fewer patients who experienced an adverse event, corresponding to a reduction by approximately three-quarters. There were seven outlier records from seven HCOs whose combined excess was 44 more patients who experienced an adverse event. The outlier HCO rate was 0.82 per 100 patients.

Unplanned return to the operating room

CI 5.1 Unplanned return to operating room on same day as initial procedure (L) In 2013, there were 848,528 patients reported from 276 HCOs. The annual rate was 0.050 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 337 fewer patients having an unplanned return to the operating / procedure room, corresponding to a reduction by approximately three-quarters. There were 13 outlier records from 13 HCOs whose combined excess was 181 more patients having an unplanned return to the operating / procedure room. The outlier HCO rate was 0.86 per 100 patients.

Unplanned transfer / admission

CI 6.1 Unplanned transfer or overnight admission related to procedure (L) In 2013, there were 411,753 patients reported from 191 HCOs. The annual rate was 0.88 per 100 patients. The potential gains totalled 3,343 fewer patients who had an unplanned transfer or overnight admission, corresponding to a reduction by approximately four-fifths. There were 34 outlier records from 32 HCOs whose combined excess was 1,557 more patients who had an unplanned transfer or overnight admission. The outlier HCO rate was 2.9 per 100 patients.



CI 6.2 Unplanned transfer or admission related to ongoing management (L) In 2013, there were 200,121 patients reported from 102 HCOs. The annual rate was 0.41 per 100 patients. The potential gains totalled 756 fewer patients who had an unplanned transfer or overnight admission, corresponding to a reduction by approximately four-fifths. There were 13 outlier records from 13 HCOs whose combined excess was 388 more patients who had an unplanned transfer or overnight admission. The outlier HCO rate was 1.5 per 100 patients.

Discharge

CI 7.1 Delayed discharge for clinical reasons exceeded 1 hour (L) In 2013, there were 228,930 patients reported from 121 HCOs. The annual rate was 0.44 per 100 patients. The potential gains totalled 974 fewer patients who had a delayed discharge greater than 1 hour, corresponding to a reduction by approximately four-fifths. There were 15 outlier records from 15 HCOs whose combined excess was 630 more patients who had a delayed discharge greater than 1 hour. The outlier HCO rate was 2.6 per 100 patients.

CI 7.2 Unplanned delayed discharge for non-clinical reasons more than 1 hour (L) In 2013, there were 134,853 patients reported from 80 HCOs. The annual rate was 0.65 per 100 patients. The potential gains totalled 856 fewer patients who had a delayed discharge greater than 1 hour, corresponding to a reduction by approximately four-fifths. There were four outlier records from four HCOs whose combined excess was 561 more patients who had a delayed discharge greater than 1 hour. The outlier HCO rate was 4.8 per 100 patients.

Departure

CI 8.1 Departure without an escort (L) In 2013, there were 76,861 patients reported from 48 HCOs. The annual rate was 0.72 per 100 patients. The potential gains totalled 543 fewer patients discharged without an escort, corresponding to a reduction by approximately four-fifths. There were eight outlier records from seven HCOs whose combined excess was 370 more patients discharged without an escort. The outlier HCO rate was 4.2 per 100 patients.

Post-discharge follow-up

CI 9.1 Follow-up phone call within 7 days (H) In 2013, there were 43,021 patients reported from 42 HCOs. The annual rate was 90.2 per 100 patients. The potential gains totalled 4,221 more patients receiving a post-discharge follow-up phone call. There were ten outlier records from ten HCOs whose combined excess was 2,767 fewer patients receiving a post-discharge follow-up phone call. The outlier HCO rate was 66.1 per 100 patients.

CI 9.2 Follow-up phone call received by patient or carer within 7 days (H) In 2013, there were 62,939 patients reported from 46 HCOs. The annual rate was 77.9 per 100 patients. The potential gains totalled 13,884 more patients or carers receiving a post-discharge phone call. There were 23 outlier records from 18 HCOs whose combined excess was 6,580 fewer patients or carers receiving a post-discharge phone call. The outlier HCO rate was 54.1 per 100 patients.



Expert Commentary

Australian Day Surgery Council (ADSC)

Pre-admission preparation

In regard to booked patients assessed before admission (**CI 1.1**), it is noted that only 50 HCOs provided data and therefore the high rate of patients who have had a pre-admission assessment may not be reflected across all the HCOs who have provided data for the other CIs.

Procedure non-attendance

Although there has been a reduction in the number of patients who have failed to arrive (**CI 2.1**), it is important that HCOs continue to review why the patients fail to arrive to ensure appropriate use of resources. Further review of the relationship between the rate of pre-admission assessment and failure to arrive would assist with this.

Procedure cancellation

It is disappointing to see an increase in cancellations after arrival due to a pre-existing medical condition (**CI 3.1**). Once again, it is important that HCOs continue to review the relationship between the rate of pre-admission assessment and this CI. Appropriate pre-admission assessment should identify a pre-existing medical condition and ensure appropriate scheduling or preparation for these patients.

However, it is encouraging to see a slight improvement with the number of patients who have been cancelled after arrival due to an acute medical condition (**CI 3.2**). It is important that HCOs review the relationship between this CI and adverse outcomes and transfers to ensure that the decrease in cancellations is due to appropriate patient selection and not HCOs admitting patients that may previously have been deemed not appropriate for their facility.

There is an encouraging improvement with **CI 3.3** this assists with appropriate use of resources. HCOs are encouraged to continue to review their processes to further improve this rate.

Episode of care adverse events

It is noted that patients who experience an adverse event during care delivery (**CI 4.1**) is one of the CIs introduced in 2013 with only 67 HCOs which have contributed data, therefore making it difficult to review the relationship between the rate of pre-admission assessment, cancellations and adverse events during care delivery.

Unplanned return to the operating room

The rate of unplanned return to operating room on same day as initial procedure (**CI 5.1**) continues to be low which is appropriate for the type of patients and procedures performed. However, it should be noted that return to theatre is not necessarily a negative; it may demonstrate that early action has been taken to avoid any long-term adverse outcomes.

Unplanned transfer / admission

It is noted that **CI 6.1** is one of the new CIs which separates the reason for transfers. It is important that HCOs review the relationship between this CI and preadmission assessment to ensure appropriate patient selection and preparation.

As per **CI 6.1**, **CI 6.2** is a new CI and may include patients who have not met their discharge criteria. Once again, it is important that HCOs review the relationship between this CI and preadmission assessment to ensure appropriate patient selection and preparation.

Discharge

In regard to **CI 7.1**, it is an excellent initiative to separate the clinical reasons for the delay from the non-clinical. HCOs are encouraged to review the relationship between these data and their pre-admission assessment. (Note that it is a higher rate than delay due to clinical reasons).

Similarly, in regard to **CI 7.2**, it is useful for HCOs to be able to identify why there has been a delay. This may be due to delay with carers picking the patient up or organisational requirements. (Note that it is a higher rate than delay due to clinical reasons).

Departure

It is noted that only 48 HCOs contributed data for **CI 8.1** and therefore this rate may not be reflected across all HCOs.

Post-discharge follow-up

It is noted that only 48 HCOs have contributed data for **CI 9.1** and **9.2**, therefore this rate may not be reflected across all HCOs.

General Comments

It is disappointing to note the relatively low uptake of the new CIs and the decrease in the number of HCOs providing data. HCOs are encouraged to review their data against their pre-admission assessment policies and protocols to identify whether a more effective pre-admission program may have further reduced their CI rate. Due to the low number of HCOs which have supplied data, the rates quoted may not be reflective of all HCOs.



Expert Commentary

Australian Day Surgery Nurses Association (ADSNA)

Pre-admission preparation

Pre-admission is one of the foremost tools to ensure that the patient is best prepared for surgery through information provision, clinical assessment and optimisation of health status. The number of booked patients assessed before admission (CI 1.1) has remained fairly static. Further opportunities exist within the remaining 13.9% of those that were not assessed as a risk management strategy.

Procedure non-attendance

The number of patients who fail to arrive (CI 2.1) has continued to improve from 0.64 in 100 patients in 2012 to 0.53 in 100 patients in 2013. Despite the figures indicating an improvement, there remains significant scope for advancement in this area. Further information is required to establish the reasons behind failure to arrive. It may not be a true reflection of the actual figure as some patients may have been contacted by the HCO with procedures cancelled or rescheduled.

Procedure cancellation

A procedure cancelled upon arrival due to a pre-existing medical condition (CI 3.1) is not necessarily a negative. Pre-existing medical conditions on arrival may mean that the information provided to patients prior to admission may need to be more robust or the condition was missed at pre-admission, the patient's condition might be a lesser risk at another facility due to the facility's capabilities in relation to acuity, and the patient's pre-existing medical condition may require further time to stabilise prior to the procedure being performed safely in that facility.

Similarly to CI 3.1, in regard to CI 3.2 a procedure cancelled upon arrival due to medical reasons is not necessarily a negative. Pre-existing medical conditions on arrival may mean that the information provided to patients prior to admission may need to be more robust or the condition was missed at pre-admission, the patient's condition might be a lesser risk at another facility due to the facility's capabilities in relation to acuity. This may be the safest outcome for the patient.

Cancellation after arrival due to administrative reasons (CI 3.3) is perhaps one of the more frustrating and inconvenient reasons for procedure cancellation. Most of the variation lies within the public sector, which may relate to resource availability or general inefficiency. Additional information is required to make further recommendations to ensure a substantial improvement in this area.

Episode of care adverse events

In regard to CI 4.1, minimisation of an adverse event is the desirable outcome for any procedure. An adverse event is sometimes unavoidable, however risk management of patients in terms of pre-admission assessment and management aims to minimise the risk of adverse events occurring. Other factors, of course, which are outside the realm of the patient's medical condition, can come into play. Root cause analysis of adverse events is an extremely useful tool that enables us to further understand the event and why it occurred, and establish strategies to further minimise patient risk in similar situations in the future.

Unplanned return to the operating room

Unplanned return to the operating theatre on the same day (CI 5.1) has increased slightly, but remains fairly low (a low rate is the desired outcome). Unplanned return to theatre can reflect many things, but not all necessarily negative. For example, it could be the early detection of a complication that may more easily be rectified in the OR and with less dire consequences. Additional information is required to determine the true reasons for return to the operating room.

Unplanned transfer / admission

Unplanned transfer or overnight admission related to the procedure (CI 6.1) indicates inadequate patient risk assessment and/or inadequate care resulting in complications requiring the patient's transfer and further monitoring and management. The aim here is to ensure robust pre-admission assessment and admission assessment. It is more preferable to cancel a patient on admission than have an unplanned transfer.

Unplanned transfer or admission related to ongoing management is indicative of quality of care. HCOs need to ensure robust credentialing, ongoing education, strong recruitment and selection criteria, robust policies and procedures and risk management program are in place to minimise the risk of this occurring.



Discharge

There are no comparative data in the report to show the change from the previous period(s) for **CI 7.1**. Additional information is required in relation to the clinical reason(s) for the delay: Is the figure of 1 hour reasonable for the type of procedure performed? Is the procedure or patient appropriate for this facility? Are the appropriate anaesthetic agents, analgesia, etc., being used for day procedure patients?

CI 7.2 has the greatest scope for improvement. Factors such as social reasons are one of the more common reasons for delay (i.e. carers not available to collect patient at required time of discharge). More robust pre-admission assessment and education, admission assessment and discharge planning is required to reduce this figure. Again, it is better to reschedule or cancel a patient prior to or on admission, than to have discharge delayed causing possible bed blockage.

Departure

Ideally, patients should not be discharged without an escort (**CI 8.1**). However, there is no information provided in relation to the type of anaesthesia used, the type of procedures performed or patient demographics which may give further insight into the number of unaccompanied discharges.

Post-discharge follow-up

Follow-up phone calls post-procedure (**CI 9.1**) result in fewer post-procedure complications, improved patient communication and education, and greater patient comfort and satisfaction. A higher figure is desirable in this area. It is interesting to note that the figure is higher in private HCOs than public, possibly due to resourcing and patient demographics, and higher in metropolitan than non-metropolitan areas. Additional information is required to draw more accurate conclusions in relation to these differences.

Again, a higher figure is desirable in **CI 9.2**. The issue here is that although an HCO has attempted to contact a patient or carer, there is no guarantee that the patient or carer will receive the call. The vast majority of patients / carers do speak with the HCO post-discharge, but there are a number of patients / carers who do not respond for whatever reason. Further work can be done in this area to improve this process by reinforcing expectations at pre-admission, admission and during discharge planning.

General comments

CIIs can be used as a way of benchmarking service provision against other HCOs. CIIs help to identify issues. Further root cause analysis can help to determine reasons for the issues, drive quality improvement initiatives and raise service standards.



Emergency Medicine

VERSION 5.1

Waiting time

CI 1.1 ATS Category 1 patients attended to immediately (H) In 2013, there were 25,420 patients reported from 158 HCOs. The annual rate was 99.3 per 100 patients. The fitted rate improved from 99.1 to 99.4, a change of 0.26 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were nine outlier records from eight HCOs whose combined excess was 118 fewer patients allocated ATS Category 1 who were attended to immediately. The outlier HCO rate was 90.2 per 100 patients.

CI 1.2 ATS Category 2 patients attended to within 10 minutes (H) In 2013, there were 437,108 patients reported from 170 HCOs. The annual rate was 81.2 per 100 patients. The fitted rate improved from 73.4 to 80.5, a change of 7.1 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 7.1 per 100 patients. In 2013, the potential gains totalled 51,627 more patients allocated ATS Category 2 who were attended to within 10 minutes. There were 56 outlier records from 40 HCOs whose combined excess was 15,954 fewer patients allocated ATS Category 2 who were attended to within 10 minutes. The outlier HCO rate was 70.5 per 100 patients.

CI 1.3 ATS Category 3 patients attended to within 30 minutes (H) In 2013, there were 1,426,265 patients reported from 168 HCOs. The annual rate was 66.0 per 100 patients. The fitted rate improved from 61.4 to 64.6, a change of 3.2 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 3.5 per 100 patients. In 2013, the potential gains totalled 375,627 more patients allocated ATS Category 3 who were attended to within 30 minutes. There were 57 outlier records from 36 HCOs whose combined excess was 97,089 fewer patients allocated ATS Category 3 who were attended to within 30 minutes. The outlier HCO rate was 49.5 per 100 patients.

CI 1.4 ATS Category 4 patients attended to within 60 minutes (H) In 2013, there were 1,700,082 patients reported from 168 HCOs. The annual rate was 73.1 per 100 patients. The fitted rate improved from 63.7 to 71.4, a change of 7.7 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 7.7 per 100 patients. In 2013, the potential gains totalled 388,007 more patients allocated ATS Category 4 who are attended to within 60 minutes. In 2013, there were 81 outlier records from 53 HCOs whose combined excess was 87,897 fewer patients allocated ATS Category 4 who are attended to within 60 minutes. The outlier HCO rate was 61.7 per 100 patients.

CI 1.5 ATS Category 5 – attended within 120 minutes

(H) In 2013, there were 366,766 patients reported from 167 HCOs. The annual rate was 90.7 per 100 patients. The fitted rate improved from 85.5 to 88.2, a change of 2.6 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.7 per 100 patients. In 2013, the potential gains totalled 28,800 more patients allocated ATS Category 5 who were attended to within 120 minutes. There were 65 outlier records from 45 HCOs whose combined excess was 10,196 fewer patients allocated ATS Category 5 who were attended to within 120 minutes. The outlier HCO rate was 81.1 per 100 patients.

Acute myocardial infarction (AMI) management

CI 2.1 Thrombolytic therapy administration to AMI patients within 1 hour (H) In 2013, there were 400 patients reported from 34 HCOs. The annual rate was 62.3 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013.

Access block

CI 3.1 Total ED time exceeded 8 hours (L) In 2013, there were 671,576 patients reported from 55 HCOs. The annual rate was 20.4 per 100 patients. The fitted rate improved from 33.5 to 25.4, a change of 8.1 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 7.8 per 100 patients. In 2013, the potential gains totalled 91,154 fewer ED patients admitted or planned for admission whose total ED time exceeded 8 hours, corresponding to a reduction by approximately one-half. There were 43 outlier records from 27 HCOs whose combined excess was 42,484 more ED patients admitted or planned for admission whose total ED time exceeded 8 hours. The outlier HCO rate was 36.7 per 100 patients.

CI 3.2 Mental health admitted patients whose total ED exceeded 4 hours (L) In 2013, there were 11,245 patients reported from 23 HCOs. The annual rate was 61.9 per 100 patients. The fitted rate deteriorated from 41.5 to 54.9, a change of 13.3 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 14.2 per 100 patients. In 2013, the potential gains totalled 3,742 fewer admitted mental health patients, whose total ED time exceeded 4 hours, corresponding to a reduction by approximately one-half. In 2013, there were ten outlier records from six HCOs whose combined excess was 906 more admitted mental health patients whose total ED time exceeded 4 hours. The outlier HCO rate was 79.9 per 100 patients.



CI 3.3 Critical care admitted patients whose total ED time exceeded 4 hours (L)

In 2013, there were 23,490 patients reported from 28 HCOs. The annual rate was 36.4 per 100 patients. The potential gains totalled 2,164 fewer admitted critical care patients whose total ED time exceeded 4 hours, corresponding to a reduction by approximately one-quarter. There were 24 outlier records from 15 HCOs whose combined excess was 3,360 more admitted critical care patients whose total ED time exceeded 4 hours. The outlier HCO rate was 70.1 per 100 patients.

Mental health assessment turnaround time

CI 4.1 Mean time from referral to assessment by a mental health worker (L) In 2013, there were 5,384 patients reported from three HCOs. The mean time from ED referral to assessment by a mental health worker was 63 minutes.

CI 4.2 Median time from referral to assessment by a mental health worker (L) In 2013, there were 5,384 patients reported from three HCOs. The median time from ED referral to assessment by a mental health worker was 28 minutes.

Paediatric patient management

CI 5.1 Mean time of first antibiotic administration – infants <28 days with sepsis (L) In 2013, there were 16 infants reported from two HCOs. The mean time of first antibiotic administration in septic infants <28 days was 213 minutes.

CI 5.2 Salbutamol therapy within 30 minutes of arrival for asthma patients (H) In 2013, there were 215 patients reported from four HCOs. The annual rate was 50.2 per 100 patients. The potential gains totalled 104 more paediatric ED patients who presented with asthma and who received salbutamol therapy within 30 minutes.

Discharge communication in older patients

CI 6.1 Discharge communication for ED patients aged 65 or more (H) In 2013, there were 11,649 patients reported from three HCOs. The annual rate was 81.0 per 100 patients. The potential gains totalled 1,417 more patients aged 65 years or older discharged from ED to home or residential accommodation with discharge communication provided to a primary care provider. There were two outlier records from one HCO whose combined excess was 510 fewer patients aged 65 years or older discharged from ED to home or residential accommodation with discharge communication provided to a primary care provider. The outlier HCO rate was 67.4 per 100 patients.

CI 6.2 Documented risk assessment for ED patients aged 65 years or more (H)

In 2013, there were 7,600 patients reported from two HCOs. The annual rate was 32.1 per 100 patients. The potential gains totalled 374 more ED patients aged 65 years or older who had a documented risk assessment prior to discharge to home or residential accommodation. There was one outlier record from one HCO whose combined excess was 88 fewer ED patients aged 65 years or older who had a documented risk assessment prior to discharge to home or residential accommodation. The outlier HCO rate was 27.5 per 100 patients.

Pain management

CI 7.1 Initial pain assessment score – adults with abdominal or limb pain (H) In 2013, there were 10,786 patients reported from four HCOs. The annual rate was 28.9 per 100 patients. The potential gains totalled 5,072 more ED patients with abdominal or limb pain who had a documented initial pain assessment score. There were two outlier records from one HCO whose combined excess was 971 fewer ED patients with abdominal or limb pain who had a documented initial pain assessment score. The outlier HCO rate was 18.4 per 100 patients.

CI 7.2 Re-assessment pain score – adults with abdominal or limb pain (H) In 2013, there were 159 patients reported from two HCOs. The annual rate was 79.9 per 100 patients. The potential gains totalled nine more ED patients with abdominal or limb pain who had a documented pain re-assessment score.

CI 7.3 Analgesic therapy within 30 minutes – adults with abdominal or limb pain (H) In 2013, there were 9,406 patients reported from two HCOs. The annual rate was 25.7 per 100 patients. The potential gains totalled 367 more ED patients with abdominal or limb pain who received analgesic therapy within 30 minutes. There was one outlier record from one HCO whose combined excess was 158 fewer ED patients with abdominal or limb pain who received analgesic therapy within 30 minutes. The outlier HCO rate was 21.4 per 100 patients.



Patients who did not wait

CI 8.1 Patients presenting with a mental health complaint who did not wait (L) In 2013, there were 31,193 patients reported from 20 HCOs. The annual rate was 5.4 per 100 patients. The potential gains totalled 1,194 fewer ED patients presenting with a mental health complaint who did not wait after having clinical information documented, corresponding to a reduction by approximately two-thirds. There were four outlier records from three HCOs whose combined excess was 363 more ED patients presenting with a mental health complaint who did not wait after having clinical information documented. The outlier HCO rate was 11.1 per 100 patients.

CI 8.2 Total number of patients who did not wait (L)

In 2013, there were 1,277,111 patients reported from 39 HCOs. The annual rate was 3.9 per 100 patients. The potential gains totalled 33,649 fewer ED patients who did not wait after having clinical information documented, corresponding to a reduction by approximately two-thirds. There were 23 outlier records from 16 HCOs whose combined excess was 11,569 more ED patients who did not wait after having clinical information documented. The outlier HCO rate was 6.1 per 100 patients.

Expert Commentary

Australasian College for Emergency Medicine (ACEM)

Waiting time

All HCOs are doing well in ATS Category 1 (**CI 1.1**), for which numbers remain small with an overall downward trend. Even the 20th percentile was 99.5% suggesting that even HCOs with overall poor performance are able to respond immediately to this group of critically ill patients.

The overall performance in ATS Category 2 (**CI 1.2**) reached target at 81.2% overall, but with the 20th centile sitting just below this at 78.2%. Thus, most HCOs are sitting around the 80% benchmark and as a result, one in five of these 'emergency' patients are not seen within 10 minutes. With the number of ATS Category 2 patients nearing half a million in 2013, work to raise performance in this high acuity category has the potential to yield significant improvements in patient safety and care.

ATS Category 3 (**CI 1.3**) is the standout underperformer again, failing to meet the 75% Australasian College for Emergency Medicine benchmark for the eighth consecutive year. In 2013, the overall compliance was 66%, rising 2.4% since 2012, but in the context of a 3.4% drop in patient numbers. Analysis of the data for each state illustrates that the overall compliance of 66% hides huge variations in performance within and between states; some HCOs are reaching over 90% compliance while others sit below 50%. All the poor performers are in metropolitan areas, likely reflecting greater patient numbers and access block. The clear message here is that new initiatives to improve performance in ATS Category 3 should target the lowest performing HCOs, whose patients have the most to gain.

The story is repeated for ATS Category 4 (**CI 1.4**), the largest patient group, where numbers are at a record low of 1.7 million patients, an 8.4% drop from 2012, but coupled with a much smaller 2.3% rise in compliance. It is encouraging to see that ATS

Category 4 now exceeds its 70% Australasian College for Emergency Medicine benchmark by a comfortable 3.1%. However, the overall 73.1% compliance blends the outstanding performance of some HCOs (>90%) with very poor results from the bottom 10-15% (< 60%). As for ATS Category 3, there is considerable scope to improve patient access to ED via targeting low performing HCOs for interventions.

The drop in ATS Category 5 (**CI 1.5**) patient numbers continues with 9.6% fewer patients than 2012 and an enormous 36% drop over the last 7 years with compliance reaching a new high of 90.7%. The overall simplicity of these patients coupled with smaller numbers and longer timeframe means that most HCOs deal well with this group. This category should not be prioritised for intervention as there are considerably greater and more clinically significant gains to be made in the ATS Category 3 and 4 groups.



Acute myocardial infarction (AMI) management

The number of patients who receive thrombolysis (**CI 2.1**) has decreased as PCI has become the mainstay of treatment in hospitals with an interventional cardiology service. The emphasis is now on door-to-balloon time as a marker for quality care for STEMI patients. Most thrombolysis would occur in outer metropolitan and regional areas, and the rate continues to be stable.

Access block

The trend for **CI 3.1** is to an overall aggregate slow improvement in waiting times for admission or transfer, continuing the trend experienced since 2008.

There is a worrying trend that this group of admitted mental health patients' time in ED (**CI 3.2**) has worsened in contrast to patients in ED overall. This was more marked in metropolitan than non-metropolitan hospitals, presumably reflecting the complexity of patients and bed availability in metropolitan areas.

Overall, critical care admitted patients who were admitted to ICU (**CI 3.3**) had a reduction in numbers for those whose waiting time exceeded 4 hours compared to the previous 2 years' data. However, the rate for NSW was markedly elevated compared to the other states' data, presumably reflecting ICU bed availability in NSW.

Mental health assessment turnaround time

In regard to **CI 4.1**, such patients are a vulnerable group that present to EDs. The ED environment can be particularly stressful for this group. Timeliness of both assessment by a mental health worker and admission, when required, is an indication of good care for this group. In addition, mental health presentations to ED

can highlight gaps in community care. **CI 4.1** and **CI 4.2** should be considered in conjunction with **CI 3.2**.

It is disappointing that there has been extremely poor uptake of both **CI 4.1** and **CI 4.2**, with only three HCOs reporting in 2013. The poor uptake of these CIs is likely to relate to the need for chart review and may also relate to lack of documentation in the chart of both time of referral to and time of assessment by a mental health worker. Increased reporting of these CIs should be encouraged.

With a mean time of 63 minutes and median time of 28 minutes from referral to time of assessment by a mental health worker, many mental health patients are still left waiting for several hours for assessment (80th centile 156 minutes for mean time and 80th centile 102 minutes for median time).

Paediatric patient management

The low numbers of cases submitted within **CI 5.1** make the results difficult to assess. Unfortunately a chart review is required to assess this CI. Although a full septic screen is usually conducted prior to the administration of IV antibiotics, a median result of 243 minutes is much longer than would be desirable for septic neonates.

In regard to **CI 5.2**, wheeze remains one of the commonest presenting complaints to an ED. Many children are now classified as reactive airways disease, but still benefit from early administration of salbutamol. The low numbers of cases results from the laborious nature of chart reviews, these results cannot be considered representative.

Discharge communication in older patients

Discharge communication (**CI 6.1**) is important for all patients presenting to the ED, but is particularly important for

the elderly. Only 3 HCOs reported this CI in 2013, reflecting extremely poor uptake of an important CI of continuity of care for the elderly.

In this group, a rate of 81 per 100 patients having discharge communication is acceptable. It does indicate, however, that almost 1 in 5 patients over 65 did not receive discharge communication to a primary care provider.

In relation to **CI 6.2**, patients over 65 are particularly vulnerable to adverse events post-discharge from the ED. There are a number of risk assessment tools available for assessing risk in the elderly such as Identification of Seniors at Risk and Triage Risk Screening Tool.

This CI had one of the poorest uptakes with only two HCOs reporting. The annual rate of documented risk assessment for ED patients over 65 of 32.1 per 100 patients is a very poor result. The issue of safe discharge of the elderly from the ED requires further attention.

Pain management

Pain is the most frequent presenting complaint to Australian EDs. The measurement of a pain score (**CI 7.1**) is a surrogate marker of time to analgesia, as taking a pain score often (but not always) leads to the administration of analgesia. The low number of cases renders the results difficult to assess, but the vast majority of patients in pain should have a pain score and be offered appropriate analgesia.

The re-assessment of a pain score (**CI 7.2**) shows ongoing assessment of the patient with pain, and is often used to assess the effectiveness of analgesia, if it has been given. This enables the clinician to titrate analgesia to effect. As pain is the most common presenting complaint in adults, the very low number of cases renders the results difficult to assess.



Patients who did not wait

It is reassuring that there has been an increase in HCOs reporting **CI 8.1**, from seven in 2011 to 20 in 2013.

Mental health patients are a vulnerable group and often have a higher 'did not wait' rate than other ED patients. Mental health patients who do not wait for care are a particular concern.

The annual rate here is 5.4 per 100 patients for mental health patients and 3.9 per 100 patients for other ED patients. These rates are in keeping with the literature on the subject. Of concern was one HCO with a rate of 11.1 per 100 patients with a mental health complaint who did not wait.

It is difficult to define 'acceptable' did not wait rates for emergency care. It is generally accepted that a small number of patients will not wait for

care as their condition improves or was minor. A high 'did not wait' rate is generally likely to reflect excessive wait times in the ED.

Again, it is encouraging that there has been an increase in HCOs reporting **CI 8.2** from 20 in 2011 to 39 in 2013. Also encouraging is the overall reduction in the rate from 4.15 per 100 in 2011 to 3.9 per 100 in 2013.

Expert Commentary

College of Emergency Nursing Australasia (CENA)

Waiting time

Patients presenting to an ED with an emergent complaint, especially around resuscitation and airway complications, experience decreased mortality and morbidity with timely / urgent intervention.

Increased presentations to EDs, in conjunction with access block, have led to delays in 'seen' times against ATS categories. These pressures have led to changes within many EDs to the streaming of patients (fast-track, primary care clinic, see and treat, subacute, acute, short stay), in parallel to the ATS category allocation. These factors tend to group the lower ATS categories into a reality more suggestive of a three-tier triage structure.

Acute myocardial infarction (AMI) management

Thrombolytic therapy, where indicated, and where percutaneous coronary intervention (PCI) is not available within the described timeframes (delayed), is an effective therapy in the management of AMI. The timely and appropriate

administration of thrombolytics has been proven to reduce morbidity and mortality associated with ACS and specifically AMI, thus **CI 2.1** is descriptive of current best practice.¹

In line with current Acute Coronary Syndrome (ACS) guidelines and the increasing role of PCI, PCI within 90 min may also be included as a CI in conjunction with the current timely thrombolytic CI.²

Access block

Nationally, 'access block' is difficult for all EDs. Improvements are noted when a 'whole of hospital' method is used to address system wide problems. It involves evaluating the patient journey starting at triage all the way through to the patient's discharge. Hospital access, bed management and allocation are important aspects when addressing the length of time in the ED.

Initiatives that have helped with this include clinical decision units, special delivery units, hospital in the home, medical day units, discharge lounges, psychiatric emergency care centres or units and 'over census' policies

(where the wards all take one more patient than they should to ease the overcrowding in the ED).

General comments

There should be consideration placed on the workload required to collect some of these CIs. Not all listed above are able to be drawn from digital data and not all EDs have Emergency Department Information Systems. Reports such as the HRT data that compare performance help in the assessment, rationalisation and contextualisation of the CI data. Having the comparison allows HCOs to measure local performance against similar services. Obviously resource bases have a significant impact on the ability of a HCO to impact these CIs.

References

1. Chew, D. P., FCSANZa, C. N. A., FRACPb, P. E. A., Kelly, A. M., MClinEd, F. A. C. E. M., & White, H. D. (2011). 2011 Addendum to the National Heart Foundation of Australia/Cardiac Society of Australia and New Zealand Guidelines for the management of acute coronary syndromes (ACS) 2006.
2. Australian Resuscitation Council. Guideline 14.3. Acute Coronary Syndromes: Reperfusion Strategy. www.resus.org.au/policy/guidelines/section_14/14_3.htm



Gastrointestinal Endoscopy

VERSION 2

Failure to reach caecum

CI 1.1 Failure to reach caecum due to inadequate bowel preparation (L) In 2013, there were 40,261 colonoscopies reported from 34 HCOs. The annual rate was 0.33 per 100 colonoscopies. The potential gains totalled 69 fewer incomplete colonoscopies performed, corresponding to a reduction by approximately one-half. There was one outlier record from one HCO whose combined excess was eight more incomplete colonoscopies performed. The outlier HCO rate was 1.4 per 100 colonoscopies.

CI 1.2 Failure to reach caecum due to diseased colon (L) In 2013, there were 38,986 patients reported from 33 HCOs. The annual rate was 0.37 per 100 patients. The potential gains totalled 122 fewer patients having incomplete colonoscopies as a result of a diseased colon, corresponding to a reduction by approximately four-fifths. There were three outlier records from three HCOs whose combined excess was 53 more patients having incomplete colonoscopies as a result of a diseased colon. The outlier HCO rate was 2.3 per 100 patients.

CI 1.3 Failure to reach caecum due to instrument failure (L) In 2013, there were 40,318 patients reported from 33 HCOs. The annual rate was 0.017 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013.

CI 1.4 Failure to reach caecum for any other reason (L) In 2013, there were 43,952 patients reported from 36 HCOs. The annual rate was 0.25 per 100 patients. The potential gains totalled 106 fewer patients having incomplete colonoscopies for other reasons, corresponding to a reduction by approximately four-fifths. There were five outlier records from five HCOs whose combined excess was 70 more patients having incomplete colonoscopies for other reasons. The outlier HCO rate was 1.9 per 100 patients.

Adverse outcomes – colonoscopy / polypectomy

CI 2.1 Treatment for possible perforation post-polypectomy (L) In 2013, there were 57,928 patients reported from 67 HCOs. The annual rate was 0.038 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled seven fewer patients treated for possible polypectomy-related perforation, corresponding to a reduction by approximately one-quarter. There was one outlier record from one HCO whose combined excess was one more patient treated for possible polypectomy-related perforation. The outlier HCO rate was 0.46 per 100 patients.

CI 2.2 Treatment for possible perforation post-colonoscopy (L) In 2013, there were 74,171 patients reported from 67 HCOs. The annual rate was 0.030 per 100 patients. The fitted rate improved from 0.069 to 0.025, a change of 0.044 per 100 patients. The potential gains totalled 11 fewer patients treated for possible perforation not related to polypectomy, corresponding to a reduction by approximately one-half. There was one outlier record from one HCO whose combined excess was three more patients treated for possible perforation not related to polypectomy. The outlier HCO rate was 0.82 per 100 patients.

CI 2.3 Post-polypectomy haemorrhage (L) In 2013, there were 55,163 patients reported from 59 HCOs. The annual rate was 0.083 per 100 patients. The fitted rate improved from 0.20 to 0.14, a change of 0.059 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.060 per 100 patients. In 2013, the potential gains totalled 18 fewer patients who had bleeding post-polypectomy, corresponding to a reduction by approximately one-third. There were two outlier records from two HCOs whose combined excess was three more patients who had bleeding post-polypectomy. The outlier HCO rate was 0.79 per 100 patients.

Colorectal cancer

CI 3.1 Malignancies diagnosed at colonoscopy (N) In 2013, there were 17,974 patients reported from 15 HCOs. The annual rate was 1.1 per 100 patients.

CI 3.2 Malignancies not detected at another colonoscopy within past 5 years (L) In 2013, there were 126 patients reported from 10 HCOs. The annual rate was 15.1 per 100 patients. The potential gains totalled 17 fewer patients diagnosed with colorectal malignancy within 5 years of their most recent colonoscopy, corresponding to a reduction by approximately four-fifths. There was one outlier record from one HCO whose combined excess was eight more patients diagnosed with colorectal malignancy within 5 years of their most recent colonoscopy. The outlier HCO rate was 39.4 per 100 patients.



Oesophageal dilatation – perforation

CI 4.1 Oesophageal dilatation – possible perforation

(L) In 2013, there were 4,748 patients reported from 45 HCOs. The annual rate was 0.19 per 100 patients. There was no significant trend in the fitted rate. There was relatively little variation between HCOs and so the potential gains were small in 2013. There was one outlier record from one HCO whose combined excess was three more patients treated for possible oesophageal perforation. The outlier HCO rate was 3.0 per 100 patients.

Aspiration following GI endoscopy

CI 5.1 Aspiration following endoscopy (L) In 2013, there were 112,721 patients reported from 51 HCOs. The annual rate was 0.031 per 100 patients. There was no significant trend in the fitted rate. There was relatively little variation between HCOs and so the potential gains were small in 2013.

Expert Commentary

Australian Day Surgery Council (ADSC)

Introductory Comments

Gastrointestinal Endoscopy in a day setting is generally performed as a diagnostic procedure electively or as a screening test for cancer. Data that are separate from CIs from an inpatient population must be available to indicate clearly the risks of an endoscopy in a day setting.

Failure to reach caecum

There has been an improvement in **CI 1.1**, possibly as the result of more effective preparations that are increasingly available.

Improved design of endoscopes would appear to be associated with increased success in reaching the caecum. It is expected that the rate of **CI 1.2** is higher in public HCOs because of inexperience of Endoscopists.

It is to be expected that there is little variation of **CI 1.3** as servicing and maintenance of equipment improves.

CI 1.4 covers a variety of possible reasons for failure that possibly cannot be addressed by the facility. It is expected that the rate is higher in public HCOs because of inexperience of Endoscopists.

Adverse outcomes – colonoscopy / polypectomy

The gains of **CI 2.1** are likely to be the result of improved instrument design, the availability of measures to prevent perforation and the increased tendency to refer high-risk patients to overnight stay hospitals for polypectomy.

The gains of **CI 2.2** are also likely to be the result of improved instrument design and the availability of measures to prevent perforation.

Similarly, any gains of **CI 2.3** are likely to be the result of improved instrument design, the availability of measures to control bleeding and the increased tendency to refer high-risk patients to overnight stay hospitals for polypectomy.

Colorectal cancer

CI 3.1 is a difficult CI to accurately collect as often results of previous endoscopies are not available. It is suggested that the interval be reduced to three years as this may represent a more accurate indication of a 'previously missed polyp or cancer'.

CI 3.2 represents the value of colonoscopy. It would be expected that as more people are screened and polyps removed, that the number of malignancies would decrease as polyps generally are the precursor to colon cancer.

Oesophageal dilatation – perforation

There have been no significant improvements in other forms of treatment so a relatively small gain for **CI 4.1** is to be expected.



Aspiration following GI endoscopy

There have been no significant improvements in other forms of treatment so a relatively small gain for **CI 5.1** is also to be expected.

General Comments

It is disappointing in regard to the relatively low uptake of this particular set of CIs. Possibly clearer instructions could be provided that these CIs can

be collected by 'exception' rather than collecting data for each patient, which in a busy facility is time-consuming.

Facilities that collect data and have outliers for any particular CI should be encouraged to look at the equipment that they have available, the maintenance of that equipment and also the instructions with regard to bowel preparation that is given to patients.

It is important that each Endoscopist is aware of their individual profile, especially with a procedure that is generally performed as a screening procedure in an otherwise healthy population. The Gastrointestinal Endoscopy Society of Australia should actively encourage their members to collect such data.

Expert Commentary

Gastroenterological Nurses College of Australia (GENCA)

The Gastroenterological Nurses College of Australia recognises that the data received are predominately from public hospitals. Due to the teaching and training components of the CI set there may be an increased incidence of instrument failure and complications. In regard to **CI 1.1**, individual variables with tolerance and compliance will influence the success of bowel preparation. The college has no further comments to make regarding individual CIs.





Gynaecology

VERSION 6

Blood transfusion

CI 1.1 Gynaecological surgery for benign disease – unplanned blood transfusion (L) In 2013, there were 36,686 patients reported from 44 HCOs. The annual rate was 0.76 per 100 patients. The fitted rate improved from 1.00 to 0.71, a change of 0.29 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.28 per 100 patients. In 2013, the potential gains totalled 126 fewer patients receiving an unplanned blood transfusion following gynaecological surgery for benign disease, corresponding to a reduction by approximately one-third. There were two outlier records from two HCOs whose combined excess was 11 more patients receiving an unplanned blood transfusion following gynaecological surgery for benign disease. The outlier HCO rate was 2.8 per 100 patients.

CI 1.2 Gynaecological surgery for malignant disease – unplanned blood transfusion (L) In 2013, there were 1,660 patients reported from 25 HCOs. The annual rate was 6.7 per 100 patients. The fitted rate improved from 11.6 to 6.2, a change of 5.4 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 5.4 per 100 patients. In 2013, the potential gains totalled 37 fewer patients receiving an unplanned blood transfusion following gynaecological surgery for malignant disease, corresponding to a reduction by approximately one-third. There was one outlier record from one HCO whose combined excess was five more patients receiving an unplanned blood transfusion following gynaecological surgery for malignant disease. The outlier HCO rate was 18.8 per 100 patients.

Injury to a major viscus

CI 2.1 Gynaecological surgery – injury to a major viscus with repair (L) In 2013, there were 37,020 patients reported from 38 HCOs. The annual rate was 0.42 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 35 fewer patients suffering injury to a major viscus during a gynaecological operative procedure, corresponding to a reduction by approximately one-fifth. There was one outlier record from one HCO whose combined excess was two more patients suffering injury to a major viscus during a gynaecological operative procedure. The outlier HCO rate was 2.9 per 100 patients.

Laparoscopic surgery

CI 3.1 Laparoscopic gynaecological surgery – injury to a major viscus with repair (L) In 2013, there were 11,111 patients reported from 46 HCOs. The annual rate was 0.75 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 26 fewer patients receiving an injury to a major viscus during a laparoscopic gynaecological operative procedure, corresponding to a reduction by approximately one-quarter.

CI 3.2 Laparoscopic hysterectomy – injury to ureter (L) In 2013, there were 1,838 patients reported from 25 HCOs. The annual rate was 0.16 per 100 patients. There was no significant trend in the fitted rate. There were no potential gains in 2013.

CI 3.3 Laparoscopic hysterectomy – injury to bladder (L) In 2013, there were 1,752 patients reported from 22 HCOs. The annual rate was 0.40 per 100 patients. There was no significant trend in the fitted rate. There were no potential gains in 2013. There were two outlier records from one HCO whose combined excess was two more patients receiving a bladder injury at the time of a laparoscopic hysterectomy. The outlier HCO rate was 0.61 per 100 patients

Ectopic pregnancy

CI 4.1 Laparoscopic management of ectopic pregnancy (H) In 2013, there were 641 patients reported from 27 HCOs. The annual rate was 84.9 per 100 patients. The fitted rate improved from 71.7 to 86.5, a change of 14.7 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 14.4 per 100 patients. In 2013, the potential gains totalled 34 more patients having laparoscopic management of an ectopic pregnancy.

Urogynaecology injury

CI 5.1 Pelvic floor repair – injury to major viscus (L) In 2013, there were 2,727 patients reported from 29 HCOs. The annual rate was 1.3 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 27 fewer patients receiving injury to a major viscus, corresponding to a reduction by approximately three-quarters. There were three outlier records from two HCOs whose combined excess was 13 more patients receiving injury to a major viscus. The outlier HCO rate was 9.3 per 100 patients.

CI 5.2 Pelvic floor repair – injury to ureter (L) In 2013, there were 2,094 patients reported from 22 HCOs. The annual rate was 0.096 per 100 patients. The fitted rate improved from 0.27 to 0.083, a change of 0.19 per 100 patients. There were no potential gains in 2013.



CI 5.3 Pelvic floor repair – injury to bladder (L)

In 2013, there were 2,113 patients reported from 23 HCOs. The annual rate was 0.38 per 100 patients. There was no significant trend in the fitted rate. There was relatively little variation between HCOs and so the potential gains were small in 2013.

Antibiotic prophylaxis

CI 6.1 Hysterectomy – antibiotic prophylaxis (H)

In 2013, there were 597 patients reported from seven HCOs. The annual rate was 94.3 per 100 patients. The fitted rate improved from 92.6 to 97.3, a change of 4.7 per 100 patients. The potential gains totalled 33 more patients who underwent hysterectomy who received antibiotic prophylaxis prior to surgery. There were two outlier records from one HCO whose combined excess was 24 fewer patients who underwent hysterectomy who received antibiotic prophylaxis prior to surgery. The outlier HCO rate was 36.4 per 100 patients.

Thromboprophylaxis

CI 7.1 Hysterectomy – appropriate thromboprophylaxis, patients >40 years (H)

In 2013, there were 480 patients reported from seven HCOs. The annual rate was 93.5 per 100 patients. The fitted rate improved from 78.8 to 95.5, a change of 16.7 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 16.4 per 100 patients. In 2013, the potential gains totalled 23 more moderate – to high-risk patients over 40 years who underwent hysterectomy who received thromboprophylaxis.

CI 7.2 Pelvic floor surgery – appropriate thromboprophylaxis, patients > 40 years (H)

In 2013, there were 218 patients reported from five HCOs. The annual rate was 79.8 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 30 more moderate – to high-risk patients over 40 years who underwent pelvic floor surgery who received thromboprophylaxis.

Expert Commentary

Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG)

Blood transfusion

The unplanned blood transfusion rate for benign gynaecological disease (CI 1.1) continues to trend down and is currently 7/1000 cases. Increased acceptance of the risks of transfusion as well as the need to restore abnormal pre-operative iron levels using parenteral iron have contributed to this. The rate of blood transfusion is slightly higher in the public system than the private system. Although this was not statistically significant, it is consistent with earlier reports. Many factors may contribute to this including patient selection. The HCO outlier rate was 28/1000 patients, down from 71/1000 in 2012. 'Blood and Blood Products' is now one of the ten National Safety and Quality Health Service Standards, therefore this trend will hopefully continue.

The unplanned blood transfusion rates for gynaecological surgery involving malignant disease (CI 1.2) continue to trend down. The trend is much greater than with benign disease (CI 1.1), because of the higher baseline transfusion rates due to the more complicated nature of the disease. There was one outlier in 2013 whose combined excess was five patients receiving unplanned blood transfusions. Although this may be due to the complexity of the surgery, outlying units should review their transfusion policies and the availability of an alternative such as perioperative iron transfusions.

Injury to a major viscus

The rate of injury to a major viscus with repair during gynaecological surgery (CI 2.1) has remained remarkably stable at around 4/1000.

The most concerning figure is the reduction of HCOs choosing to report. There were 38 HCOs reporting in 2013 compared to 64 HCOs in 2007. This makes drawing comparisons very difficult. The 2014 CIs have consolidated laparoscopic surgery, pelvic floor surgery and general gynaecological surgery into the one CI; hopefully this will encourage increased reporting.

Laparoscopic surgery

The rate of injury to a major viscus with repair at the time of laparoscopic gynaecological surgery (CI 3.1) is currently 7.5/1000 cases. The rate has risen slightly over the last three years although the long-term trend is stable. The rate has been constantly 1.8 times the rate of that of other gynaecological operations. This statistic may be



partly explained by the complexity of the operations. Minor gynaecological surgical procedures dilute the results found in **CI 2.1**. Interestingly, the rate has remained stable despite the introduction of new entry techniques and safer equipment. Of note is that there were no outlier HCOs in this report.

The rate of injury to the ureter at laparoscopic hysterectomy (**CI 3.2**) has also remained stable over the period from 2007 – 2013. The rate of 0.16 compares favourably with international standards.¹ This rate was consistent across all HCOs. Visualisation of the ureters at the time of laparoscopy is far superior to either abdominal or vaginal hysterectomy. Ureteric injury rates should be comparable to or lower than with the other techniques. RANZCOG through its advanced training modules will develop clear pathways for training in laparoscopic surgery. Training will be directed to those trainees planning on performing laparoscopic surgery as a Fellow, further improving outcomes for patients.

The rate of bladder injury at the time of laparoscopic hysterectomy (**CI 3.3**) was 0.4%. Overall there has been no clear trend in the rate of bladder injuries at laparoscopic hysterectomy, which has remained consistently low over time. The bladder injury rates, including those of the two outliers (0.6%), are comparable with published international comparisons.²

Ectopic pregnancy

Laparoscopic surgery remains the safest, most reliable and cost-effective way to surgically treat ectopic pregnancies.³ The rate of laparoscopic management of an ectopic pregnancy (**CI 4.1**) has continued to trend upwards and is currently 84.9%.

Urogynaecology injury

The rate of injury to a major viscus during or after pelvic floor repair (**CI 5.1**) was 1.32/100 patients. Although the trend is non-significant, there has been a consistent rise in the number. The rate was roughly twice that seen in laparoscopic and non-laparoscopic gynaecology surgery, although these CIs include more minor cases.

Given the rate is double that of the rate of injury to the bladder and ureter, the data suggest that injury to bowel or major vessel contribute significantly to this CI.

Three outlier HCOs are noted with a rate of injury to viscus of 9/100 patients. Any further comments or comparisons are difficult because the rate of visceral damage is poorly reported in the literature and small numbers mean variations between HCO may just be due to chance.

The rate of injury to the ureter after pelvic floor surgery (**CI 5.2**) continues to trend down. There was no variation between strata or HCOs. There are very few international comparisons as studies are limited, however the rate of 1 per 1000 cases is very low.

The rate of injury to the bladder after pelvic floor surgery (**CI 5.4**) remains stable at four times that of ureteric injury. This is not surprising given the anatomical proximity of the bladder and anterior vaginal wall. There was no variation between strata and little difference between HCOs. There are very few international comparisons as studies are limited, though a rate of 4 per 1000 cases is very low. In addition, major morbidity from bladder injury is rare and the prognosis is usually excellent.

Antibiotic prophylaxis

In 2013, 94/100 women were given antibiotic prophylaxis prior to hysterectomy (**CI 6.1**). This rate has trended up slightly since 2007.

There were 2 outlying HCOs whose rate of antibiotic prophylaxis was 36.4 per 100. This is well below the national average and deserves some attention.

Thromboprophylaxis

The annual rate of thromboprophylaxis utilisation prior to hysterectomy (**CI 7.1**) in 2013 was 94/100 patients. The fitted rate has risen from 79/100 patients in 2007 to 96/100 patients in 2013. Pleasingly there was no variation between strata and no outlier HCOs.

The annual rate of thromboprophylaxis utilisation in women undergoing pelvic floor surgery (**CI 7.2**) was 79/100 patients. There has been no significant trend in the fitted rate. There was no variation between the strata and no outlier HCOs. The lower rate of thromboprophylaxis utilisation for pelvic floor surgery when compared to hysterectomy could be explained by the fact that most pelvic floor cases do not enter the abdomen and are often less than one hour in duration. Nevertheless, these women are often immobilised post-operatively by a vaginal pack or catheter and are elderly. Given these factors, the importance of thromboprophylaxis should not be forgotten.

References

1. Garry R, Fountain J, Mason S, et al, The eVALuate study: two parallel randomised trials, one comparing laparoscopic with abdominal hysterectomy, the other comparing laparoscopic with vaginal hysterectomy. *BMJ*. 2004 Jan 17; 328(7432):129.
2. Lafay Pillet M-C, Leonard F, Chopin F, et al, Incidence and risk factors of bladder injuries during laparoscopic hysterectomy indicated for benign uterine pathologies: a 14.5 years' experience in a continuous series of 1501 procedures. *Human Reproduction*, Vol.24, No.4 pp. 842–849, 2009
3. Gray D, Thorburn J, Strandell A. et al, A cost-effectiveness study of a randomised trial of laparoscopy versus laparotomy for ectopic pregnancy, *The Lancet*, Volume 345, Vol 8958, pp. 1139 – 1143, 6 May 1995



Hospital in the Home

VERSION 4

Unexpected phone calls and callouts

CI 1.1 HITH admission – 1 or more unexpected telephone calls (L) In 2013, there were 14,797 patients reported from 21 HCOs. The annual rate was 3.6 per 100 patients. The fitted rate improved from 4.6 to 3.4, a change of 1.2 per 100 patients. The potential gains totalled 387 fewer patients making unexpected telephone calls, corresponding to a reduction by approximately two-thirds. There were seven outlier records from four HCOs whose combined excess was 196 more patients making unexpected telephone calls. The outlier HCO rate was 8.4 per 100 patients.

CI 1.2 HITH admission – 1 unscheduled staff callout (L) In 2013, there were 18,284 patients reported from 26 HCOs. The annual rate was 1.0 per 100 patients. The fitted rate improved from 1.3 to 1.1, a change of 0.28 per 100 patients. The potential gains totalled 110 fewer patients having a single unscheduled staff callout, corresponding to a reduction by approximately one-half. There were five outlier records from four HCOs whose combined excess was 36 more patients having a single unscheduled staff callout. The outlier HCO rate was 6.1 per 100 patients.

CI 1.3 HITH admission – more than 1 unscheduled staff callout (L) In 2013, there were 15,699 patients reported from 24 HCOs. The annual rate was 0.24 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 24 fewer patients having more than 1 unscheduled staff callout, corresponding to a reduction by approximately one-half. There were four outlier records from three HCOs whose combined excess was eight more patients having more than 1 unscheduled staff callout. The outlier HCO rate was 2.5 per 100 patients.

Program interruption

CI 2.1 Unplanned return to hospital – did not return to HITH program (L) In 2013, there were 23,710 patients reported from 34 HCOs. The annual rate was 2.8 per 100 patients. The fitted rate deteriorated from 2.2 to 2.8, a change of 0.59 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.77 per 100 patients. In 2013, the potential gains totalled 172 fewer patients having an unplanned return to hospital who did not return to the HITH program, corresponding to a reduction by approximately one-quarter. There were nine outlier records from eight HCOs whose combined excess was 108 more patients having an unplanned return to hospital who did not return to the HITH program. The outlier HCO rate was 7.3 per 100 patients.

CI 2.2 Unplanned return to hospital – back to HITH program within 24 hours (N) In 2013, there were 23,070 patients reported from 32 HCOs. The annual rate was 1.9 per 100 patients.

CI 2.3 Patients who have an unplanned return to hospital (N) In 2013, there were 28,497 patients reported from 35 HCOs. The annual rate was 3.5 per 100 patients. There was no significant trend in the fitted rate.

Unexpected deaths

CI 3.1 Unexpected deaths in patients during the HITH admission (L) In 2013, there were 17,337 patients reported from 22 HCOs. The annual rate was 0.046 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013.

CI 3.2 Unexpected death following unplanned return to hospital (L) In 2013, there were 16,680 deaths reported from 20 HCOs. The annual rate was 0.018 per 100 deaths. There were no potential gains in 2013.



Expert Commentary

Hospital in the Home Society Australasia

Introductory comments

Hospital in the Home (HITH) is the delivery of acute and post-acute care in the patient's home as a substitute for being in hospital. HITH care is provided by members of the disciplinary team from many specialties, e.g. infectious diseases, gerontology, general practice, emergency medicine, orthopaedics, cardiology, paediatrics, rehabilitation, respiratory, surgery and haematology. There is sound evidence that HITH care is safe and provides significant benefits with reduced mortality and fewer readmissions to hospital.¹

Unexpected phone calls and callouts

Data for **CI 1.1** in 2013 shows for every 100 patients commencing on a HITH program, 3.6 patients made one or more unexpected telephone calls to the HITH service. This rate is comparable to and slightly lower than previous years. Such calls may be due to changes in the patient's condition, changes in their circumstances or to seek clarification. Whilst a low rate is desirable, contact is also encouraged in the same way that inpatients are encouraged to use a call device to contact staff if they need to, hence an 'ideal' rate is difficult to establish. There was variability between jurisdictions which may reflect data collection methods as this varies widely across HITH services. There were seven outlier records with an outlier rate of 8.4 per 100 patients. Outlier services should review this CI for local trends.

The rate for **CI 1.2** was higher for non-metropolitan services. This difference may reflect differences in the ratio of clinic-type versus home visiting models as well as staffing differences including access to medical support. There were five outlier records with an outlier rate of 6.1 per 100 patients. Outlier services should review this CI for local trends. In 2013, for every 100 patients commencing on a HITH program there was 1 (one) unscheduled staff call out, comparable to previous years with an overall slightly decreasing trend.

In comparison, **CI 1.3** data show that in 2013 for every 100 patients commencing on a HITH program, 0.24 patients had more than one unscheduled staff call out which was stable compared to previous years. There were four outlier records with an outlier rate of 2.5 per 100 patients.

Program interruption

In 2013, the number of patients having an unplanned return to hospital (**CI 2.1**) during their HITH episode and not returning to the HITH program was 2.8 per 100 patients. Whilst this rate is low it has been steadily trending upwards from a rate of 2.09/100 in 2006. There were differences across jurisdictions and nine outlier records with an outlier rate of 7.3 per 100 patients. It is possible that this trend over time is due to HITH services managing patients with increasing acuity and complexity as hospitals increasingly look towards out-of-hospital models of care to manage demand. Readmission rates for HITH care compare favourably with in-hospital care.¹

The number of patients in 2013 having an unplanned return to hospital (**CI 2.2**) during their HITH episode and returning to the HITH Program within 24 hours was 1.9 per 100 patients, comparable to the previous two years during which this CI was reported and overall a low rate although the desired rate is not specified. In patients who have an unplanned return to hospital who then return to HITH within 24 hours a relatively remediable problem is likely, such as transfer of care issues (e.g. medication or equipment supply or technical issues).

The number of patients having an unplanned return to hospital during their HITH episode and subsequently returning to the HITH program more than 24 hours later (**CI 2.3**) throughout 2013 was 3.5 per 100 patients, comparable to the previous years and overall a low rate – the desired rate is not specified. Patients with unplanned return to hospital who return to HITH after >24 hours may reflect transfer of care issues, inadequate initial assessment, inadequate treatment plan or limitations in service provision. It may also reflect appropriate vigilance of the HITH service and early detection of unforeseen remediable problems.



Unexpected deaths

The rate of unexpected deaths during HITH admission (**CI 3.1**) was 0.046 per 100 patients, or one death per 2,173 HITH admissions. There were no significant stratum differences, variation between HCOs or outliers. The rate is low and is consistent with the evidence for HITH care being safe with a 19% relative reduction and 2.01% absolute reduction in mortality compared to inpatient care as shown in Caplan's systematic review.¹

CI 3.2 shows a rate of 0.018 per 100 patients, or one death per 5,555 unplanned returns to hospital. There were no significant stratum differences, variation between HCOs or outliers. The rate is low and is consistent with the evidence for HITH care being safe as stated above.

General comments

Reporting of these HITH CIs is voluntary. The number of HCOs and services reporting steadied this year compared to the decline over previous years, however, the overall participation rate is low. HITH exhibits marked heterogeneity of case-mix, models of care and information management and data collection systems. Much of the data collection for these CIs is likely to be manual and subject to resource availability. The desired rate for some CIs is not specified which impacts on the clarity of interpretation possible. These factors together may have an impact on the extent to which services can use these CIs for quality improvement purposes, and their willingness to participate in the program.

HCOs should support their HITH services in their attempts to collect CI data consistently and reliably with minimal impact on resources. The data can help to inform service safety and quality monitoring and clinical practice improvement projects, and also provide examples of evidence for HCOs relative to the National Safety and Quality Health Service Standards.

The HITH Society Safety and Quality Interest Group is aware of the factors outlined above which may impact on the participation rate and the challenges of data collection for HITH services for these CIs.

References

1. Caplan GA et al: Systematic Reviews: A meta-analysis of "hospital in the home". MJA 2012; 197: 512–519



Hospital-Wide

VERSION 11.2

Hospital readmissions

CI 1.1 Unplanned and unexpected readmissions within 28 days (L)

In 2013, there were 3,118,609 separations reported from 278 HCOs. The annual rate was 1.00 per 100 separations. The fitted rate improved from 1.6 to 1.1, a change of 0.53 per 100 separations. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.52 per 100 separations. In 2013, the potential gains totalled 24,780 fewer unplanned and unexpected readmissions within 28 days, corresponding to a reduction by approximately three-quarters. There were 104 outlier records from 64 HCOs whose combined excess was 12,683 more unplanned and unexpected readmissions within 28 days. The outlier HCO rate was 3.3 per 100 separations.

CI 1.2 Unplanned and unexpected readmission within 14 days (L)

In 2013, there were 1,210,733 separations reported from 102 HCOs. The annual rate was 0.92 per 100 separations. The fitted rate improved from 1.7 to 0.88, a change of 0.79 per 100 separations. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.75 per 100 separations. In 2013, the potential gains totalled 8,463 fewer unplanned and unexpected readmissions within 14 days, corresponding to a reduction by approximately three-quarters. There were 34 outlier records from 25 HCOs whose combined excess was 4,036 more unplanned and unexpected readmissions within 14 days. The outlier HCO rate was 2.5 per 100 separations.

Return to operating room

CI 2.1 Unplanned return to the operating room during the same admission (L)

In 2013, there were 1,956,332 patients reported from 236 HCOs. The annual rate was 0.28 per 100 patients. The fitted rate improved from 0.43 to 0.28, a change of 0.15 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.15 per 100 patients. In 2013, the potential gains totalled 3,503 fewer patients having an unplanned return to the operating room, corresponding to a reduction by approximately one-half. There were 48 outlier records from 33 HCOs whose combined excess was 1,018 more patients having an unplanned return to the operating room. The outlier HCO rate was 0.69 per 100 patients.

Pressure ulcers

3.1 Inpatients who develop one or more pressure ulcers during their admission (L)

In 2013, there were 11,991,275 bed days reported from 376 HCOs. The annual rate was 0.083 per 100 bed days. The fitted

rate deteriorated from 0.074 to 0.079, a change of 0.004 per 100 bed days. The potential gains totalled 6,741 fewer inpatients who developed one or more pressure ulcers, corresponding to a reduction by approximately two-thirds. There were 70 outlier records from 52 HCOs whose combined excess was 2,471 more inpatients who developed one or more pressure ulcers. The outlier HCO rate was 0.19 per 100 bed days.

CI 3.2 Inpatients who are admitted with one or more pressure ulcers (L)

In 2013, there were 2,498,486 admissions reported from 284 HCOs. The annual rate was 0.49 per 100 admissions. The fitted rate deteriorated from 0.092 to 0.57, a change of 0.48 per 100 admissions. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.44 per 100 admissions. In 2013, the potential gains totalled 9,578 fewer inpatients who were admitted with one or more pressure ulcers, corresponding to a reduction by approximately three-quarters. There were 130 outlier records from 85 HCOs whose combined excess was 4,747 more inpatients who were admitted with one or more pressure ulcers. The outlier HCO rate was 1.4 per 100 admissions.

Inpatient falls

CI 4.1 Inpatient falls (L)

In 2013, there were 12,434,424 bed days reported from 385 HCOs. The annual rate was 0.38 per 100 bed days. The fitted rate deteriorated from 0.36 to 0.37, a change of 0.017 per 100 bed days. The potential gains totalled 17,710 fewer inpatient falls, corresponding to a reduction by approximately one-third. There were 166 outlier records from 109 HCOs whose combined excess was 7,411 more inpatient falls. The outlier HCO rate was 0.66 per 100 bed days.

CI 4.2 Inpatient falls that require intervention beyond standard hospital protocol (L)

In 2013, there were 7,542,674 bed days reported from 268 HCOs. The annual rate was 0.069 per 100 bed days. The fitted rate improved from 0.13 to 0.089, a change of 0.041 per 100 bed days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.040 per 100 bed days. In 2013, the potential gains totalled 4,518 fewer inpatient falls where the patient's condition required intervention beyond standard hospital protocol, corresponding to a reduction by approximately four-fifths. There were 50 outlier records from 35 HCOs whose combined excess was 2,090 more inpatient falls where the patient's condition required intervention beyond standard hospital protocol. The outlier HCO rate was 0.20 per 100 bed days.



CI 4.3 Fractures or closed head injuries that result because of an inpatient fall (L) In 2013, there were 9,420,029 bed days reported from 270 HCOs. The annual rate was 0.009 per 100 bed days. The fitted rate deteriorated from 0.007 to 0.009, a change of 0.001 per 100 bed days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.001 per 100 bed days. In 2013, the potential gains totalled 305 fewer fractures or closed head injuries that resulted from an inpatient fall, corresponding to a reduction by approximately one-third. There were eight outlier records from eight HCOs whose combined excess was 34 more fractures or closed head injuries that resulted from an inpatient fall. The outlier HCO rate was 0.066 per 100 bed days.

CI 4.4 Inpatient falls in people aged 65 years and over (L) In 2013, there were 4,528,167 bed days reported from 234 HCOs. The annual rate was 0.54 per 100 bed days. The fitted rate deteriorated from 0.49 to 0.53, a change of 0.034 per 100 bed days. The potential gains totalled 7,637 fewer falls in inpatients aged 65 years and older, corresponding to a reduction by approximately one-quarter. There were 59 outlier records from 47 HCOs whose combined excess was 2,422 more falls in inpatients aged 65 years and older. The outlier HCO rate was 0.90 per 100 bed days.

Patient deaths

CI 5.1 Deaths addressed within a clinical audit process (H) In 2013, there were 18,011 deaths reported from 175 HCOs. The annual rate was 96.4 per 100 deaths. The fitted rate improved from 82.6 to 97.3, a change of 14.7 per 100 deaths. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 13.9 per 100 deaths. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were 19 outlier records from 15 HCOs whose combined excess was 470 fewer patient deaths addressed within a clinical audit process. The outlier HCO rate was 69.7 per 100 deaths.

Blood transfusion

CI 6.1 Significant adverse blood transfusion events (L) In 2013, there were 78,329 transfusions reported from 146 HCOs. The annual rate was 0.19 per 100 transfusions. The fitted rate improved from 0.29 to 0.19, a change of 0.10 per 100 transfusions. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.12 per 100 transfusions. In 2013, the potential gains totalled 58 fewer significant adverse blood transfusion events, corresponding to a reduction by approximately one-third.

There were four outlier records from three HCOs whose combined excess was 16 more significant adverse blood transfusion events. The outlier HCO rate was 0.83 per 100 transfusions.

CI 6.2 Transfusion episodes where informed patient consent was not documented (L) In 2013, there were 16,515 transfusions reported from 75 HCOs. The annual rate was 4.0 per 100 transfusions. The fitted rate improved from 6.7 to 3.7, a change of 3.0 per 100 transfusions. In 2013, the potential gains totalled 579 fewer transfusions without documented informed patient consent, corresponding to a reduction by approximately four fifths. In 2013, there were 17 outlier records from 13 HCOs whose combined excess was 406 more transfusions without documented informed patient consent. The outlier HCO rate was 20.9 per 100 transfusions.

CI 6.3 RBC transfusions when the HB reading is 100g/L or more (L) In 2013, there were 23,279 transfusions reported from 61 HCOs. The annual rate was 1.6 per 100 transfusions. The fitted rate improved from 2.6 to 1.5, a change of 1.1 per 100 transfusions. The potential gains totalled 129 fewer RBC transfusions, corresponding to a reduction by approximately one-third. There were nine outlier records from seven HCOs whose combined excess was 98 more RBC transfusions. The outlier HCO rate was 5.8 per 100 transfusions.

Day of surgery admissions

CI 7.1 Admission of elective surgery patients on the day of surgery (H) In 2013, there were 78,120 patients reported from 32 HCOs. The annual rate was 88.1 per 100 patients. The fitted rate improved from 85.2 to 89.2, a change of 4.1 per 100 patients. The potential gains totalled 8,965 more elective surgery patients admitted on the day of surgery. There were eight outlier records from five HCOs whose combined excess was 5,280 fewer elective surgery patients admitted on the day of surgery. The outlier HCO rate was 63.3 per 100 patients.

Thromboprophylaxis

CI 8.1 High-risk medical patients admitted who receive VTE prophylaxis (H) In 2013, there were 3,901 patients reported from 12 HCOs. The annual rate was 90.2 per 100 patients. The potential gains totalled 260 more high-risk medical patients who received VTE prophylaxis. There were three outlier records from three HCOs whose combined excess was 127 fewer high-risk medical patients who received VTE prophylaxis. The outlier HCO rate was 73.9 per 100 patients.



Expert Commentary

Royal Australasian College of Medical Administrators (RACMA)

Hospital readmissions

The rate for **CI 1.1** has improved significantly from 2012, and continues the significant downward trend since 2005. The outlier HCO rate continues to decline more rapidly than the average and this would relate to the recent focus on better discharge planning and especially since the introduction of the National Standards.

The trend remains favourable and would indicate continuing overall improvement in care and in discharge planning, notwithstanding that this CI is difficult to accurately collect because determining whether a readmission is 'unexpected' can be difficult. The private sector rate remains significantly lower than the public sector and this may relate to case-mix and also to the fact that readmissions with complications might be more likely to be admitted through an ED to a public HCO.

Outlier HCOs should review their data and undertake case review to determine whether the outlier status relates to the measurement of 'readmission was unexpected', or whether deficiencies in care or discharge planning may be causing the outlier status.

The rate for **CI 1.2** has remained essentially the same as 2012 and continues its downward trend since 2008. The rate in participating public HCOs remains higher than that for participating private HCOs. This may relate to the same factors as in **CI 1.1**. Early readmissions tend more to reflect complications arising from the admission than from a failure of discharge planning. Outlier HCOs should review their data using a clinical audit process within the clinical units to determine whether their outlier status relates to care in the admission or poor discharge planning.

Review of readmissions is important as it allows short-term feedback and has the best chance of achieving provider driven improvement in care and safety. Clinicians tend to be receptive to review within their unit with short-loop feedback.

State variation in NSW and QLD might relate to reporting issues and should be addressed at state level.

Return to operating room

The mean and centile rates for **CI 2.1** have been improving in a statistically significant way over the past 8 years, with a steady improvement from 0.44% (one in 227) in 2005 to 0.28% (one in 357) in 2013; in other words, for every 1,000 operations done, there are now 1.6 less unplanned returns. In the context of 1.95 million operations, this has saved 3,100 patients the trauma and risk of an unplanned return to theatre in 2013.

Whilst this is likely to be attributable to better credentialing and scoping, surgical techniques and training, and the introduction of College-mediated review such as VASM and WASM, there remains room for improvement, with 25 HCOs submitting at least one outlier record in 2013.

Clinicians at HCOs that are outliers (in fact all HCOs) need to undertake case review to determine the reasons for return to the operating room. This may relate to patient complexity in some HCOs. Attention to credentialing and scoping, surgical techniques, supervision, morbidity and mortality review and training may bring further improvements.

Pressure ulcers

With a similar number of HCOs reporting, the incidence of patients developing one or more pressure ulcers while in care (**CI 3.1**) has deteriorated from 2012 and has not changed markedly since 2007 despite efforts to raise awareness, and to improve risk profiling and prevention.

This may in part relate to better reporting and to ageing of the population, but is also a significant area for improvement, at the very least through an accountability approach to risk profiling and the actions being taken in response.

This is an area where a significant jurisdictional effort, an evidence-based, best-practice approach, and increased resourcing may well demonstrate a benefit. It continues to be hoped that the minimum criteria and actions required in the new NSQHS Standard 8: Preventing and Managing Pressure Injuries will start to lead to an improvement in this CI.

CI 3.2 relates to inpatients who are admitted with a pressure ulcer, i.e. the pressure ulcer is most likely to have developed at home, in an RCF, in another HCO, or be a readmission from the same HCO. This CI has deteriorated since 2009, and has again increased significantly over 2012, indicating the need for a jurisdictional approach to pressure ulcers outside acute HCOs and a consideration by the Aged Care Standards and Accreditation Agency (ACSAA) of pressure ulcers in RCFs.

Acute HCOs also have a part to play in feeding back to the RCF when the patient has been admitted with a pressure ulcer; the RCF may benefit from case review in improving its practices.

There might also be a case for a community-wide educational approach to pressure ulcers.



Inpatient falls

The incidence of inpatient falls (**CI 4.1**) has not changed markedly since 2007, despite efforts to raise awareness, and to improve risk profiling and prevention.

This may in part relate to increased awareness and reporting, ageing of the population, and also to the trend towards earlier mobilisation. It remains a significant area for improvement however, at a minimum through an accountability approach to risk profiling and the actions taken in response.

There is now a considerable evidence base relating to falls prevention and, as shown by the data, considerable variation between best-practice and outlier organisations. Local efforts have been shown to reduce incidence of falls, including inpatient rounding, patient huddles, placement of patients, supported bathrooming, support from relatives and carers, and placement of patients.

This is an area where a significant jurisdictional effort, an evidence-based, best-practice approach, and increased resourcing may well demonstrate a benefit. It continues to be hoped that the minimum criteria and actions required in the new NSQHS Standard 10: Preventing Falls and Harm from Falls will start to lead to an improvement in this CI.

HCOs have also found considerable variation between the rate of falls reported through incident reporting mechanisms and the actual rate of falls; HCOs should therefore review how they collect data on falls.

Notwithstanding, the number of HCOs reporting on **CI 4.2** has decreased in 2013 and has now shown significant improvement over a seven-year period. Private HCOs reported a significantly lower rate than public facilities, probably due to case-mix factors.

It is felt that there might be data reporting difficulties with this CI as both of the related **CI**s, **4.1** and **4.3**, have demonstrated deterioration; nevertheless the improvement is noteworthy.

CI 4.3 has gradually deteriorated over a seven-year period, despite efforts to protect patients when they fall (ward and bed design, hip protectors, etc.).

A fall with fracture or head injury should be considered to be a 'critical incident', requiring critical incident review or root cause analysis to determine whether the injury could have been prevented and to apply the lessons across the organisation.

The issues here are similar to those in **CI 4.1**, and the CIs should be viewed together, with the additional issues around protecting patients once they fall; including the cost, discomfort, and lack of acceptability of hip protectors; and the differing views around the efficacy of cot sides in preventing or exacerbating injury.

Falls are far more common in the over 65 age group, and there has been little change, in fact deterioration, in **CI 4.4** as expected in light of **CI 4.1** and **CI 4.3**. Falls in the aged are a major public health issue, both inside and outside of HCOs. This area remains in need of considerable academic evidence development, and the jurisdictional and HCO introduction of evidence-based best practice in prevention.

Patient deaths

Given the acknowledged criticality of unit-based mortality review, it is surprising that participation in **CI 5.1** fell again in 2013 after rising over the six-year period prior to 2012.

The mean has steadily increased over the last eight years, although variation among the participating HCOs is limited, the rate for 15 outlier HCOs is 69.7%, leaving scope for improvement. HCO outliers should be undertaking unit mortality review (or central review where unit review is not applicable) in order to achieve close to 100%.

It is recognised that improving mortality review rates can be a significant contributor to improving hospital standardised mortality rates in the medium to long term.

Blood transfusion

The rate for **CI 6.1** was slightly higher than 2013 at 0.19% (one in 526 transfusions), however the trend has been down over the last eight years. There were three outlier HCOs responsible for an outlier rate of 0.83 per 100 transfusions.

Jurisdictions have significantly improved their approach to transfusion safety in recent years. The significant and continuing improvements in the adverse transfusion event rate, and the increasing involvement of HCOs in this CI, reflect this approach.

Outlier HCOs would benefit from a review of their transfusion safety program in conjunction with the relevant jurisdiction, and against NSQHS Standard 7.

The rate for **CI 6.2** has slightly risen to 4.02% in 2013, however there remains a significant decline since the peak of 8.65% in 2009.

Blood transfusion is an invasive procedure and not without risk. Informed consent is mandatory under the new NSQHS Standard 7, and also in common law and other national and state standards and policies.



The trend is satisfactory, but one in 25 transfusions (4%) are being carried out without informed consent and the goal should be 0%.

Outlier jurisdictions and HCOs should consider their policy position in this regard, appropriately educate medical and nursing staff, and audit compliance.

There has been a small deterioration to 1.55% in transfusions in patients with satisfactory haemoglobin (Hb) readings of 100 g/L or more (**CI 6.3**), however the rate has declined favourably over the last eight years.

Higher variations in some states might relate to low numbers, albeit the variation is statistically significant.

Appropriateness of blood transfusion is an important issue given the scarce nature of the resource. This CI shows an improved trend in this regard. Outlier organisations

should review their guidelines in accordance with NSQHS Standard 7. In non metropolitan areas, medical administrators may need to monitor this issue more closely in the absence of specialist resources, utilising routine medical record review as an information source.

Day of surgery admissions

The rate for **CI 7.1** is essentially unchanged from previous years at approximately 90%. Public HCOs (82.2%) had lower rates than the nine private HCOs that reported this CI (96.3%), in part related to case – mix and complexity, but perhaps also indicating insufficient incentive to improve efficiency.

This approach to admission for elective surgery is now well entrenched for efficiency, patient safety and preference; the improved outcome reflects this.

Yet improvement is required, and outlier organisations should give consideration to clinical pathway development to this end, noting that a small percentage of patients will require earlier admission for justifiable clinical reasons.

Thromboprophylaxis

The rate for **CI 8.1** has significantly improved from 86.7% in 2011 to 64.2% in 2012 to 90.2% in 2013, however only 12 HCOs reported on this important CI (three less HCOs than in 2012).

The outlier rate was 73.9%, and, taken together with the low participation rate, there remains a need, despite this apparent good outcome, for a more consistent and evidence based approach on this CI from jurisdictions, the Australian Commission on Safety and Quality in Health Care, and from specialist colleges.

Expert Commentary

Australian College of Nursing (ACN)

Introductory comments

It is interesting to see a reducing number of HCOs participating in most of the CIs. This is an important project and as such there should be greater incentive for healthcare organisations to participate, no matter what the results are.

The results for all areas, but particularly pressure ulcer, inpatient falls and blood transfusion, have been significant for positive patient outcomes and are relevant to nurse-sensitive CIs.

Individual colleges or societies should use the CIs that are particular to their area of interest / expertise to raise awareness among

members. Greater awareness of CIs should be encouraged among all healthcare workers.

Hospital readmissions

Whilst the decreasing trend in **CI 1.1** is pleasing to see, there is still a great deal of improvement that can be made. This may also be reflective of a number of improvements in the acute and primary health sectors, such as appointments of discharge planners, community liaison positions, the implementation of the (now somewhat contentious) Medicare Local programs throughout Australia, improved community services and programs (home care packages).

The differences between private and public HCOs is not surprising, and is most likely reflective of the case-mix, as well as Discharge Planners and their early involvement in planning for discharge.

An increased focus on holistic screening and discharge planning on admission, adequate support for the patient and their families / carers, the use of specialised nursing roles and improved communication between acute and community services will help to decrease readmission rates.

The College notes that the number of participating HCOs declined despite the CI being a relatively easy measure of care quality to collect.



A declining number of HCOs are reporting against **CI 1.2**. Although there is a fairly even number of private and public HCOs reporting, the annual rate has remained virtually unchanged over the past three years.

It is interesting to see the fitted rate trending downwards, indicating appropriate discharge planning is occurring during the primary admission, and suggestive of less complications occurring from the primary admission.

Some states reported significantly more outliers than other states. Those HCOs with outliers would benefit from reviewing their cases of unplanned and unexpected readmissions within 14 days to determine if there is improvement that can be made.

Return to operating room

The trend of **CI 2.1** data indicates the continued improvement in unplanned returns to the operating room during the same admission, with 3,503 fewer patients having an unplanned return.

Processes that could be contributing to this continued improvement include a greater focus on systems and procedures to identify and manage risks and hazards

The public rate sits much higher than the overall and private rates, however even allowing for population differences, there is significant room for improvement by public HCOs.

The 33 outlier HCOs' rate of 0.69 per 100 patients raises questions in relation to the perioperative practice, with these outliers encouraged to review quality programs that are focussed on pre-operative and post-operative practices.

Pressure ulcers

The deterioration in the rate of **CI 3.1** has continued from previous years. As this CI falls predominantly within the scope of nursing practice, it is extremely disappointing to see. However, the College notes an increase in participation rates which is a positive result for nursing.

The changing role of the RN in the acute setting may have some influence on this CI. Although many HCOs are appointing Assistants in Nursing (AINs) to undertake the tasks that the RN is no longer able to do, adequate supervision and monitoring of competence ensures quality outcomes.

Quality improvement programs targeted at decreasing pressure ulcers should be implemented, and a holistic approach taken in preventing pressure ulcers. Any prevention and treatment strategies would ideally follow the patients from the acute facilities through to community care, as many of the factors that cause pressure ulcers are from long term issues.

The increase in **CI 3.2** may reflect better identification and reporting of pressure ulcers by hospital staff, as well as improved communication between community agencies and the HCO. Increasing use of AINs who provide personal care tasks may also be contributing to the reporting of this CI.

The deterioration in this, and the previous CI, suggests that there is significant focus required to treat the predisposing factors that increase the risk of developing pressure ulcers such as malnutrition, decreased mobility and cognition as well as pharmacology.

This CI also points to the need for increased and improved communication between community care and acute facilities, to ensure that risk factors do not lead to development of pressure ulcers.

The College again notes a positive result for nursing through an increase in participation rates.

Inpatient falls

The annual rate of **CI 4.1** has remained virtually unchanged over the last few years despite the increased focus on falls prevention. The lack of any significant difference between public and private or states and territories suggests that the factors relating to inpatient falls are generalised and widespread rather than linked to a specific population or co-morbidity.

Despite greater focus on falls, and research into programs that can assist with addressing falls risks along with increased resources available to health professionals online, this CI continues to deteriorate.

Falls prevention works best when aimed at changing behaviour rather than simply educating. This behaviour modification would ideally be aimed at not only patients, but also family / carers and hospital staff.

It is hoped, with continued and renewed focus on falls prevention, this CI will eventually begin to decline. NSW has developed a number of resources for HCOs to assist with managing falls.¹

The College is pleased to see the improvement of **CI 4.2**, especially given the result from **CI 4.1**. This raises a question around interpretation – have the protocols in HCOs changed to be in line with the increase in the frail aged cohort of patients, therefore the interventions are now considered standard hospital protocol? Further information is needed regarding the definition of standard hospital protocol, and the relevant guidelines should be consistent from year to year in order for the data to be benchmarked.



The significantly decreased number of HCOs participating in this CI is disappointing to see. It would be worthwhile investigating this decreasing number with the aim of increasing the overall participation. Nursing staff are well placed within HCOs to lead falls awareness and prevention programs. Their interaction with patients and families provide opportunity to encourage and reinforce falls awareness and prevention behaviour modification.

The mostly stable annual rate of **CI 4.3**, combined with the deterioration in the fitted rate, does suggest that falls awareness and prevention strategies are not working in this particular populace. Certainly the deterioration is in contrast to **CI 4.2** where falls requiring intervention beyond standard protocol has reduced sharply. It would be expected that if inpatient falls resulting in fracture or closed head injury increased, then intervention beyond standard protocol may be required – e.g. surgery. This is concerning given that this particular group of patients can be extremely high-cost, and as well as a significant burden on the healthcare system.

There is no significant change to the data reported under **CI 4.4** in 2013 compared to 2012, despite the fact that the HCO population is aging, with higher numbers of complex and higher acuity patients – particularly within the public HCOs.

The absence of significant change is also noteworthy when considering the deterioration in **CI 4.1** – the number of inpatient falls – and suggests that collection of data on inpatient falls in other age groups, or within a breakdown of this age group, would be beneficial.

HCOs with outlier rates within this CI need to review their falls management protocols and falls prevention education, to reduce the current rate of falls – which is nearly double the fitted rate for all reporting HCOs.

Patient deaths

The improvement in **CI 5.1** is extremely pleasing to see, and certainly suggests that HCOs are giving this trend the attention that it deserves.

The 15 HCOs whose combined rate is significantly less than that of the annual rate are strongly recommended to urgently set in place processes that address this CI.

The clinical audit review process addressing deaths is an important quality improvement process as well as an appropriate measure of standards and processes within the HCO.

The decreasing participation in this CI does not go unnoticed, and would be worthy of further investigation and attention.

Blood transfusion

The deterioration in **CI 6.1** is pleasing to see as it is representative of the focus of the many quality improvement projects over the last few years. Despite this, there are still many outlier HCOs, and states, that should look at policies and practices to determine where the issues lie.

It is pleasing to see improvements in **CI 6.2**, showing that there are less episodes of transfusion without documented patient consent. Improvements are likely to be linked to an increase in knowledge around the legal requirements of consent, HCOs providing clarification of what constitutes consent, and an increased focus on safety and patient rights. The outlier rate of 20.9 per 100 transfusions without documented consent is concerning, and these HCOs need to critically review cases without informed consent and identify causes for the omissions.

The deterioration in **CI 6.3** is pleasing to see, and is hopefully a reflection on the increased focus of when blood transfusions are required, and alternative therapies that are available. The outlier HCOs, particularly in WA, should conduct further analysis into why their rates are comparatively so high, focussed especially on the situations and reasons why they are being given.

Day of surgery admissions

It is pleasing to note that the number of public HCOs reporting on **CI 7.1** is greater than the number of private HCOs reporting the number of elective surgery patients admitted on the day of surgery.

However, given the overall small number of HCOs reporting against this CI, it is likely that the majority of private HCOs reporting against this CI include Day Surgery facilities or HCOs providing day surgery.

Public HCOs admitting patients with complex pre-operative preparations may also impact on this data, preventing admission on the day of surgery.

Thromboprophylaxis

As with previous years, **CI 8.1** is still considered to be controversial, and without internal system reporting systems can be difficult to capture.

There has been a decrease in the HCOs participating in this CI, although the rate of incidence significantly increased. The increase to 90.2 per 100 patients should be useful to use for further analysis.

References

1. www.cec.health.nsw.gov.au/programs/falls-prevention/falls-resources





Infection Control

VERSION 3.1

Surgical site infections

CI 1.1 Superficial incisional SSI in hip prosthesis procedures (L) In 2013, there were 22,445 procedures reported from 153 HCOs. The annual rate was 0.53 per 100 procedures. The fitted rate improved from 1.0 to 0.53, a change of 0.50 per 100 procedures. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.49 per 100 procedures. In 2013, the potential gains totalled 31 fewer superficial incisional SSIs, corresponding to a reduction by approximately one-quarter.

CI 1.2 Deep incisional SSI in hip prosthesis procedures (L) In 2013, there were 22,759 procedures reported from 151 HCOs. The annual rate was 0.58 per 100 procedures. The fitted rate improved from 0.77 to 0.62, a change of 0.15 per 100 procedures. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.16 per 100 procedures. In 2013, the potential gains totalled 30 fewer deep incisional / organ space SSIs, corresponding to a reduction by approximately one-fifth. There were two outlier records from two HCOs whose combined excess was three more deep incisional / organ space SSIs. The outlier HCO rate was 3.8 per 100 procedures.

CI 1.3 Superficial incisional SSI in knee prosthesis procedures (L) In 2013, there were 31,594 procedures reported from 154 HCOs. The annual rate was 0.47 per 100 procedures. The fitted rate improved from 0.88 to 0.44, a change of 0.44 per 100 procedures. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.43 per 100 procedures. In 2013, the potential gains totalled 20 fewer superficial incisional SSIs, corresponding to a reduction by approximately one-tenth.

CI 1.4 Deep incisional SSI in knee prosthesis procedures (L) In 2013, there were 31,603 procedures reported from 150 HCOs. The annual rate was 0.39 per 100 procedures. There was no significant trend in the fitted rate. The potential gains totalled 36 fewer deep incisional / organ space SSIs, corresponding to a reduction by approximately one-quarter. There was one outlier record from one HCO whose combined excess was two more deep incisional / organ space SSIs. The outlier HCO rate was 1.9 per 100 procedures.

CI 1.5 CABG – superficial incisional SSI (chest incision site) (L) In 2013, there were 6,018 procedures reported from 34 HCOs. The annual rate was 0.78 per 100 procedures. The fitted rate improved from 1.3 to 0.87, a change of 0.39 per 100 procedures. This trend was also

significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.39 per 100 procedures. In 2013, the potential gains totalled 12 fewer superficial incisional SSIs, corresponding to a reduction by approximately one-quarter.

CI 1.6 CABG – deep incisional / organ space SSI (chest incision site) (L) In 2013, there were 6,138 procedures reported from 34 HCOs. The annual rate was 0.88 per 100 procedures. There was no significant trend in the fitted rate. The potential gains totalled nine fewer deep incisional / organ space SSIs, corresponding to a reduction by approximately one tenth.

CI 1.7 CABG – superficial incisional SSI (donor incision site) (L) In 2013, there were 3,853 procedures reported from 22 HCOs. The annual rate was 1.0 per 100 procedures. The fitted rate improved from 1.9 to 1.3, a change of 0.60 per 100 procedures. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.70 per 100 procedures. In 2013, the potential gains totalled 13 fewer superficial incisional SSIs, corresponding to a reduction by approximately one-third.

CI 1.8 CABG – deep incisional / organ space SSI (donor incision site) (L) In 2013, there were 3,853 procedures reported from 22 HCOs. The annual rate was 0.16 per 100 procedures. There was no significant trend in the fitted rate. There were no potential gains in 2013.

CI 1.9 Colectomy – superficial incisional SSI (elective, no stoma) (L) In 2013, there were 1,027 procedures reported from 22 HCOs. The annual rate was 2.6 per 100 procedures. There was no significant trend in the fitted rate. The potential gains totalled six fewer superficial incisional SSIs, corresponding to a reduction by approximately one-fifth.

CI 1.10 Colectomy – deep incisional / organ space SSI (elective, no stoma) (L) In 2013, there were 1,027 procedures reported from 22 HCOs. The annual rate was 2.7 per 100 procedures. There was no significant trend in the fitted rate. The potential gains totalled six fewer deep incisional / organ space SSIs, corresponding to a reduction by approximately one-fifth.

CI 1.11 Superficial incisional SSI in femoro-popliteal bypass procedures (L) In 2013, there were 99 procedures reported from seven HCOs. The annual rate was 4.0 per 100 procedures. There were no potential gains in 2013. There were four outlier records from three HCOs whose combined excess was five more superficial incisional SSIs. The outlier HCO rate was 5.5 per 100 procedures.



CI 1.12 Deep incisional SSI in femoro-popliteal

bypass procedures (L) In 2013, there were 99 procedures reported from seven HCOs. The annual rate was 1.0 per 100 procedures. There were no potential gains in 2013.

CI 1.13 Open AAA – superficial incisional SSI (L)

In 2013, there were 69 procedures reported from four HCOs. The annual rate was 0 per 100 procedures. There were no potential gains in 2013.

CI 1.14 Open AAA – deep incisional / organ space

SSI (L) In 2013, there were 69 procedures reported from four HCOs. The annual rate was 0 per 100 procedures. There were no potential gains in 2013.

CI 1.15 Superficial incisional SSI in lower segment caesarean section procedures (L)

In 2013, there were 37,402 procedures reported from 89 HCOs. The annual rate was 0.61 per 100 procedures. The fitted rate improved from 1.0 to 0.56, a change of 0.49 per 100 procedures. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.46 per 100 procedures. In 2013, the potential gains totalled 109 fewer superficial incisional SSIs, corresponding to a reduction by approximately one-third. There were five outlier records from five HCOs whose combined excess was 16 more superficial incisional SSIs. The outlier HCO rate was 2.8 per 100 procedures.

CI 1.16 LSCS – deep incisional / organ space SSI (L)

In 2013, there were 38,800 procedures reported from 89 HCOs. The annual rate was 0.15 per 100 procedures. There was no significant trend in the fitted rate. The potential gains totalled 27 fewer deep incisional / organ space SSIs, corresponding to a reduction by approximately one-third. There were three outlier records from three HCOs whose combined excess was seven more deep incisional / organ space SSIs. The outlier HCO rate was 1.3 per 100 procedures.

CI 1.17 Superficial incisional SSI in abdominal

hysterectomy procedures (L) In 2013, there were 2,430 procedures reported from 37 HCOs. The annual rate was 1.1 per 100 procedures. There was no significant trend in the fitted rate. The potential gains totalled 20 fewer superficial incisional SSIs, corresponding to a reduction by approximately three-quarters. There were four outlier records from four HCOs whose combined excess was ten more superficial incisional SSIs. The outlier HCO rate was 7.6 per 100 procedures.

CI 1.18 Deep incisional / organ space SSI in abdominal hysterectomy procedures (L)

In 2013, there were 2,430 procedures reported from 37 HCOs. The annual rate was 0.33 per 100 procedures. There was no significant trend in the fitted rate. There was relatively little variation between HCOs and so the potential gains were small in 2013.

Central line-associated bloodstream infections

CI 2.1 Adult ICU-related centrally-inserted (CI) CLUR (N)

In 2013, there were 85,659 patient days reported from 29 HCOs. The annual rate was 50.8 per 100 patient days. The fitted rate decreased from 66.3 to 46.2, a change of 20.1 per 100 patient days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 20.9 per 100 patient days.

CI 2.2 Adult ICU-related peripherally-inserted (PI)

CLUR (N) In 2013, there were 74,282 patient days reported from 26 HCOs. The annual rate was 7.3 per 100 patient days. The fitted rate increased from 7.0 to 9.6, a change of 2.6 per 100 patient days.

CI 2.3 Paediatric ICU-associated CI-CLABSI (L)

No data were submitted for this CI in 2013.

CI 2.4 CI central line days – Paediatric ICU (N)

No data were submitted for this CI in 2013.

CI 2.5 Paediatric ICU-associated PI-CLABSI (L)

No data were submitted for this CI in 2012 or 2013.

CI 2.6 PI central line days – Paediatric ICU

No data were submitted for this CI in 2013.

CI 2.7 Haematology Unit CI CLABSI rate (L)

In 2013, there were 19,941 line-days reported from five HCOs. The annual rate was 0.60 per 1000 line-days. There was relatively little variation between HCOs and so the potential gains were small in 2013.

CI 2.8 Haematology Unit PI CLABSI rate (L)

In 2013, there were 14,413 line-days reported from five HCOs. The annual rate was 0.97 per 1000 line-days. There were no potential gains in 2013.

CI 2.9 Oncology Unit CI CLABSI rate (L)

In 2013, there were 288,480 line-days reported from 11 HCOs. The annual rate was 0.028 per 1000 line-days. The fitted rate improved from 0.74 to 0.064, a change of 0.67 per 1,000 line-days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.43 per 1,000 line-days. In 2013, the potential gains totalled seven fewer bloodstream infections, corresponding to a reduction by approximately four-fifths. There were two outlier records from one HCO whose combined excess was five more bloodstream infections. The outlier HCO rate was 0.47 per 1,000 line-days.



CI 2.10 Oncology Unit PI CLABSI rate (L) In 2013, there were 30,785 line-days reported from nine HCOs. The annual rate was 0.065 per 1000 line-days. The fitted rate improved from 0.31 to 0.089, a change of 0.22 per 100 patient days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.24 per 100 patient days. There were no potential gains in 2013.

CI 2.11 OPIV Unit CI CLABSI rate (L) In 2013, there were 16,742 line-days reported from two HCOs. The annual rate was 0 per 1000 line-days. There were no potential gains in 2013.

CI 2.12 OPIV Unit PI CLABSI rate (L) In 2013, there were 7,601 line-days reported from three HCOs. The annual rate was 0 per 1000 line-days. There were no potential gains in 2013.

Haemodialysis-associated bloodstream infection surveillance

CI 3.1 Haemodialysis fistula-associated blood stream (L) In 2013, there were 12,390 patient-months reported from 20 HCOs. The annual rate was 0.048 per 100 patient-months. The fitted rate improved from 0.13 to 0.079, a change of 0.055 per 100 patient-months. There was relatively little variation between HCOs and so the potential gains were small in 2013.

CI 3.2 Haemodialysis synthetic graft-associated bloodstream (L) In 2013, there were 1,259 patient-months reported from 15 HCOs. The annual rate was 0.24 per 100 patient-months. The fitted rate improved from 1.4 to 0.20, a change of 1.2 per 100 patient-months. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.0 per 100 patient-months. There were no potential gains in 2013.

CI 3.3 Haemodialysis – native vessel graft access-associated BSI (L) In 2013, there were 240 patient-months reported from 12 HCOs. The annual rate was 0 per 100 patient-months. There were no potential gains in 2013.

CI 3.4 Haemodialysis – CI non-cuffed line access-associated BSI (L) In 2013, there were 234 patient-months reported from 12 HCOs. The annual rate was 0.43 per 100 patient-months. The fitted rate improved from 8.5 to 0.28, a change of 8.2 per 100 patient-months. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 9.0 per 100 patient-months. There were no potential gains in 2013.

CI 3.5 Haemodialysis – CI cuffed line access-associated BSI (L) In 2013, there were 4,067 patient-months reported from 20 HCOs. The annual rate was 1.1 per 100 patient-months. The fitted rate improved from 3.1 to 0.94, a change of 2.2 per 100 patient-months. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.0 per 100 patient-months. In 2013, the potential gains totalled 16 fewer bloodstream infections, corresponding to a reduction by approximately one-third.

Neonatal infections

CI 4.1 Early onset infection – inborn neonates (L) In 2013, there were 13,883 babies reported from 10 HCOs. The annual rate was 0.043 per 100 babies. The fitted rate improved from 0.12 to 0.033, a change of 0.086 per 100 babies. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.082 per 100 babies. There were no potential gains in 2013.

CI 4.2 Early onset infection – inborn neonates 37 or more weeks gestation (L) In 2013, there were 11,648 babies reported from ten HCOs. The annual rate was 0.017 per 100 babies. There was no significant trend in the fitted rate. There were no potential gains in 2013.

CI 4.3 NICU Neonates birth weight <1000 g – BSI within 48 hours of birth (L) In 2013, there were 52 babies reported from two HCOs. The annual rate was 7.7 per 100 babies. There were no potential gains in 2013.

CI 4.4 Late onset intensive care infection – neonates, birth weight 1000 g or more (L) In 2013, there were 1,188 babies reported from two HCOs. The annual rate was 0.51 per 100 babies. There were no potential gains in 2013.

CI 4.5 NICU Neonates <1000 g birth weight – BSI more than 48 hours after birth (L) In 2013, there were 4,748 patient-days reported from three HCOs. The annual rate was 0.23 per 100 patient-days. There were no potential gains in 2013.

CI 4.6 NICU Neonates 1000 g or more birth weight – BSI >48 hours of birth (L) In 2013, there were 16,365 patient-days reported from three HCOs. The annual rate was 0.10 per 100 patient-days. The potential gains totalled seven fewer babies who had a significant bloodstream infection, corresponding to a reduction by approximately one-third.



Healthcare-associated methicillin resistant *Staphylococcus aureus* (MRSA) morbidity

CI 5.1 ICU-associated new MRSA healthcare-associated infections in a sterile site (L) In 2013, there were 200,359 bed days reported from 62 HCOs. The annual rate was 1.1 per 10,000 bed days. The fitted rate improved from 4.7 to 0.95, a change of 3.7 per 10,000 bed days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 3.5 per 10,000 bed days. In 2013, the potential gains totalled six fewer new MRSA healthcare-associated infections in a sterile site, corresponding to a reduction by approximately one-quarter.

CI 5.2 ICU-associated new MRSA HAIs in a non-sterile site (L) In 2013, there were 203,247 bed days reported from 63 HCOs. The annual rate was 3.8 per 10,000 bed days. The fitted rate improved from 16.0 to 3.9, a change of 12.1 per 10,000 bed days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 11.6 per 10,000 bed days. In 2013, the potential gains totalled 36 fewer new MRSA healthcare-associated infections in a non-sterile site, corresponding to a reduction by approximately one-third.

CI 5.3 Non ICU-associated new MRSA inpatient HAIs in a sterile site (L) In 2013, there were 6,475,654 bed days reported from 138 HCOs. The annual rate was 0.19 per 10,000 bed days. The fitted rate improved from 0.64 to 0.21, a change of 0.43 per 10,000 bed days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.41 per 10,000 bed days. In 2013, the potential gains totalled 27 fewer new MRSA inpatient healthcare-associated infections in a sterile site, corresponding to a reduction by approximately one-fifth. There was one outlier record from one HCO whose combined excess was two more new MRSA inpatient healthcare-associated infections in a sterile site. The outlier HCO rate was 1.3 per 10,000 bed days.

CI 5.4 Non ICU-associated new MRSA HAIs in a non-sterile site (L) In 2013, there were 6,327,829 bed days reported from 133 HCOs. The annual rate was 0.97 per 10,000, bed days. The fitted rate improved from 2.3 to 1.1, a change of 1.2 per 10,000 bed days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.2 per 10,000 bed days. In 2013, the potential gains totalled 432 fewer new MRSA healthcare-associated infections in a non-sterile site, corresponding to a reduction by approximately two-thirds. There were nine outlier records from seven HCOs whose combined excess was 155 more new MRSA healthcare-associated infections in a non-sterile site. The outlier HCO rate was 3.5 per 10,000 bed days.

Occupational exposures to blood and/or body fluids

CI 6.1 Reported parenteral exposures sustained by staff (L) In 2013, there were 13,223,767 bed days reported from 363 HCOs. The annual rate was 0.034 per 100 bed days. The fitted rate improved from 0.041 to 0.034, a change of 0.006 per 100 bed days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.006 per 100 bed days. In 2013, the potential gains totalled 1,893 fewer reported parenteral exposures, corresponding to a reduction by approximately one-third. There were 18 outlier records from 12 HCOs whose combined excess was 338 more reported parenteral exposures. The outlier HCO rate was 0.058 per 100 bed days.

CI 6.2 Reported non-parenteral exposures sustained by staff (L) In 2013, there were 13,146,965 bed days reported from 359 HCOs. The annual rate was 0.013 per 100 bed days. The fitted rate improved from 0.015 to 0.014, a change of 0.002 per 100 bed days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.002 per 100 bed days. In 2013, the potential gains totalled 745 fewer reported non-parenteral exposures, corresponding to a reduction by approximately one-third. There were 16 outlier records from 11 HCOs whose combined excess was 203 more reported non-parenteral exposures. The outlier HCO rate was 0.035 per 100 bed days.



Expert Commentary

Australasian College for Infection Prevention & Control (ACIPC)

Introductory comments

The surveillance of HAIs is a cornerstone of infection prevention programs. It is a fundamental component of modern health care, demonstrated by the recently released National Safety and Quality Health Service Standards for Australian HCOs including nineteen criteria on the prevention and control of HAIs, which specifically mandate HAI surveillance.¹

Australia does not have a formal, uniform national HAI surveillance program, however most HCOs would undertake HAI surveillance and participate in statewide programs where they exist.

Uncertainty exists regarding methodology of HAI surveillance processes between facilities and states and territories. Whilst there has been formal validation studies at a state level^{2,3}, no national validation has been performed, and a recent review highlighted the variation of surveillance activities.⁴

Subsequently, any national level data have several limitations that will impact the strength of the data and the ability to make any comparisons. These limitations include:

The Intensity of Surveillance

- Not all facilities undertake post-discharge (PD) surgical SSI surveillance. Many superficial infections occur post-discharge, particularly in patients with short hospital stays. Further, there is no recommended method for conducting PD SSI surveillance. The inclusion or exclusion of PD SSI data greatly influences SSI rates and can often lead to underestimating true infection rates.⁵

- Some states and territories mandate surveillance and reporting of certain infections. Evidence exists that the intensity of surveillance for these infections is actually less than non-mandatory infection reporting.⁵
- It is unknown if the method used to detect infections and the data sources used are uniform across all participating sites (including denominator data).

Definitions and Education

- It is unclear which definitions are used for the detection of HAIs, and how accurately and consistently these definitions are applied across all hospitals.
- Generally infection prevention and control staff are responsible for collecting data on HAIs. However, it is unknown if these staff have been trained to collect the data in a uniform way, or if they are regularly assessed to measure agreement.

Risk Adjustment

- Clearly some hospitals have patients who are at a greater risk of infection than others. To appropriately report data, risk adjustment methods should be used. Lack of risk adjustment makes any comparisons unreasonable.

Future initiatives

The Australian Commission on Safety and Quality in Health Care's National Surveillance Initiative will eventually address many of the limitations listed above. Recent developments such as the adoption of national definitions and implementation guidelines for *Staphylococcus aureus* bacteraemia, *Clostridium difficile* infection and central line-associated bloodstream infection is the first step toward true national HAI surveillance.⁶ It is anticipated that ACSQHC will also

work on similar initiatives for surgical site infection surveillance in the near future.

The Australasian College for Infection Prevention and Control supports HAI surveillance as key to infection prevention, and supports the use of sound epidemiological methodology to ensure meaningful data.

The College acknowledges that although the use of national data is limited, many facilities undertake high quality HAI surveillance and use their own data to improve practice and increase the safety and quality of care for their patients.

The College supports the work of the ACSQHC National Surveillance Initiative to explore options for a national surveillance system to monitor healthcare-associated infections.

References

1. Australian Commission on Safety and Quality in Health Care. Standard 3. Preventing and Controlling Hospital Acquired Infection, in Safety and Quality Improvement Guide 2012, Commonwealth of Australia: Sydney.
2. McBryde, E.S., *et al.*, Validation of statewide surveillance system data on central line-associated bloodstream infection in intensive care units in Australia. *Infect Control Hosp Epidemiol*, 2009. 30(11): p. 1045-9.
3. VanGessel, H., McCann, RL., Peterson, AM., Goggin, LS, Validation of healthcare associated *Staphylococcus aureus* bloodstream infection surveillance in Western Australia. *Healthcare Infection*, 2010. 15: p. 21-5.
4. McLaws, M.-L., Epidemiology of healthcare-associated infections: uses, pitfalls and the future. *Microbiology Australia*, 2014. 35(1): p. 17-23.
5. Tanner, J., *et al.*, A benchmark too far: findings from a national survey of surgical site infection surveillance. *Journal of Hospital Infection*, 2013. 83(2): p. 87-91.
6. Australian Commission on Safety and Quality in Health Care. National Surveillance Initiative, in National Surveillance Initiative 2013. Website accessed 2 May 2014 www.safetyandquality.gov.au/our-work/healthcare-associated-infection/national-hai-surveillance-initiative/



Intensive Care

VERSION 4.1

Access and exit block

CI 1.1 ICU adult non-admission due to inadequate resources (L) In 2013, there were 64,566 patients reported from 62 HCOs. The annual rate was 2.2 per 100 patients. The fitted rate improved from 5.8 to 1.7, a change of 4.1 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 3.9 per 100 patients. In 2013, the potential gains totalled 1,377 fewer patients who could not be admitted to the ICU due to access block, corresponding to a reduction by approximately four-fifths. There were 22 outlier records from 13 HCOs whose combined excess was 754 more patients who could not be admitted to the ICU due to access block. The outlier HCO rate was 7.8 per 100 patients.

CI 1.2 ICU – elective adult surgery deferred / cancelled due to bed unavailability (L) In 2013, there were 63,010 admissions reported from 59 HCOs. The annual rate was 0.90 per 100 admissions. The fitted rate improved from 2.8 to 0.67, a change of 2.2 per 100 admissions. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.0 per 100 admissions. In 2013, the potential gains totalled 540 fewer elective surgical cases deferred or cancelled, corresponding to a reduction by approximately four-fifths. There were 14 outlier records from ten HCOs whose combined excess was 268 more elective surgical cases deferred or cancelled. The outlier HCO rate was 3.4 per 100 admissions.

CI 1.3 ICU – adult transfer to another facility / area due to bed unavailability (L) In 2013, there were 57,768 patients reported from 57 HCOs. The annual rate was 0.96 per 100 patients. The fitted rate improved from 1.2 to 0.78, a change of 0.37 per 100 patients. The potential gains totalled 532 fewer patients transferred to another facility / ICU, corresponding to a reduction by approximately four-fifths. There were 14 outlier records from ten HCOs whose combined excess was 324 more patients transferred to another facility / ICU. The outlier HCO rate was 5.1 per 100 patients.

CI 1.4 Adult patients whose discharge from the ICU was delayed more than 6 hours (L) In 2013, there were 63,540 patients reported from 67 HCOs. The annual rate was 25.4 per 100 patients. The potential gains totalled 14,602 fewer patients whose discharge from ICU was delayed more than 6 hours, corresponding to a reduction by approximately four-fifths. There were 39 outlier records from 26 HCOs whose combined excess was 5,509 more patients whose discharge from ICU was delayed more than 6 hours. The outlier HCO rate was 50.3 per 100 patients.

CI 1.5 Adult patients discharged from the ICU between 6pm and 6am (L)

In 2013, there were 69,045 patients reported from 72 HCOs. The annual rate was 14.8 per 100 patients. The fitted rate improved from 16.9 to 15.1, a change of 1.8 per 100 patients. The potential gains totalled 6,598 fewer patients discharged from the ICU between 6pm and 6am, corresponding to a reduction by approximately one-half. There were 41 outlier records from 27 HCOs whose combined excess was 2,714 more patients discharged from the ICU between 6pm and 6am. The outlier HCO rate was 28.6 per 100 patients.

Intensive care patient management

CI 2.1 Rapid response calls to adult ICU patients within 72 hours of ICU discharge (L)

In 2013, there were 46,178 patients reported from 56 HCOs. The annual rate was 3.5 per 100 patients. The potential gains totalled 1,320 fewer rapid response calls within 72 hours of discharge from the ICU, corresponding to a reduction by approximately four-fifths. There were 11 outlier records from eight HCOs whose combined excess was 652 more rapid response calls within 72 hours of discharge from the ICU. The outlier HCO rate was 10.8 per 100 patients.

Intensive care patient treatment

CI 3.1 VTE prophylaxis in adults within 24 hours of admission to ICU (H)

In 2013, there were 63,303 patients reported from 63 HCOs. The annual rate was 93.6 per 100 patients. The fitted rate improved from 74.9 to 92.8, a change of 17.9 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 16.4 per 100 patients. In 2013, the potential gains totalled 3,967 more patients given VTE prophylaxis within 24 hours. There were 28 outlier records from 22 HCOs whose combined excess was 1,969 fewer patients given VTE prophylaxis within 24 hours. The outlier HCO rate was 80.6 per 100 patients.

Central line-associated bloodstream infection

CI 4.1 Adult ICU-associated CI-CLABSI (L)

In 2013, there were 81,861 line-days reported from 41 HCOs. The annual rate was 0.51 per 1000 line-days. The fitted rate improved from 2.5 to 0.60, a change of 1.9 per 1,000 line-days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.8 per 1,000 line-days. In 2013, the potential gains totalled six fewer Adult ICU-associated CI-CLABSIs, corresponding to a reduction by approximately one-tenth.



CI 4.2 Adult ICU-associated PI-CLABSI (L) In 2013, there were 11,032 line-days reported from 29 HCOs. The annual rate was 0.70 per 1000 line-days. There was no significant trend in the fitted rate. There was relatively little variation between HCOs and so the potential gains were small in 2013.

Utilisation of patient assessment systems

CI 5.1 Participation in the ANZICS CORE Adult Patient Database (APD) (H) In 2013, there were 61,155 admissions reported from 61 HCOs. The annual rate was 95.0 per 100 admissions. The fitted rate improved from 89.0 to 92.8, a change of 3.8 per 100 admissions. The potential gains totalled 3,026 more complete submissions to the ANZICS Database. There were 18 outlier records from 13 HCOs whose combined excess was 2,192 fewer complete submissions to the ANZICS Database. The outlier HCO rate was 76.2 per 100 admissions.

CI 5.2 Participation in the ANZICS CORE Critical Care Resources Survey (N) In each of the last two years, one of the reporting HCOs did not participate in the survey.

Minimum standards for a rapid response system

CI 6.1 Rapid response system calls to adult patients (N) In 2013, there were 1,290,430 patients reported from 60 HCOs. The annual rate was 31.9 per 1000 patients.

CI 6.2 Rapid response system calls to adult patients within 24 hours of admission (N) In 2013, there were 952,019 patients reported from 43 HCOs. The annual rate was 7.6 per 1000 patients.

CI 6.3 Adult patients who have experienced a cardiopulmonary arrest (L) In 2013, there were 1,222,419 patients reported from 54 HCOs. The annual rate was 1.2 per 1000 patients. The potential gains totalled 971 fewer patients who had cardiopulmonary arrest, corresponding to a reduction by approximately one-half. There were 14 outlier records from 11 HCOs whose combined excess was 313 more patients who had cardiopulmonary arrest. The outlier HCO rate was 3.0 per 1000 patients.

CI 6.4 Deaths in adult patients – no NFR order (L) In 2013, there were 630,492 patients reported from 28 HCOs. The annual rate was 1.1 per 1000 patients. The potential gains totalled 480 fewer deaths in adult patients who did not have a not-for-resuscitation order, corresponding to a reduction by approximately two-thirds. There were six outlier records from four HCOs whose combined excess was 233 more deaths in adult patients who did not have a not-for-resuscitation order. The outlier HCO rate was 3.9 per 1000 patients.

CI 6.5 Adult deaths in all patients (L) In 2013, there were 1,023,624 patients reported from 45 HCOs. The annual rate was 11.7 per 1000 patients. The potential gains totalled 7,466 fewer deaths, corresponding to a reduction by approximately one-half. There were 24 outlier records from 16 HCOs whose combined excess was 2,522 more deaths. The outlier HCO rate was 20.4 per 1000 patients.

Expert Commentary

Australian and New Zealand Intensive Care Society (ANZICS)

Introductory comments

ANZICS welcomes and supports ACHS in the development and assessment of CIs for Intensive Care practice. This CI set provides valuable information about the performance of ICUs in a number of domains. Findings are likely to be representative of current Intensive Care practices even though not all hospitals contribute to the program.

Contributing hospitals should interpret their own performance in light of knowledge about patients' underlying severity of illness, case-mix, processes and organisation. Submission of CIs to benchmarking programs such as that of ACHS should be seen as being of the highest priority for all hospitals.

Access and exit block

CIs 1.1 to 1.3 demonstrate improving access for patients needing Intensive Care services at contributing hospitals. The progressive reduction in refusals of admission to ICU because of inadequate resources, cancellations of elective surgery and transfers of critically ill patients due to ICU bed unavailability is reassuring, but there remains considerable



variability between hospitals. In some (predominantly public) hospitals this remains an important problem. Provision of ICU beds has mirrored population growth over this time so it is likely that factors other than just the number of available ICU beds account for these trends. These may include increasing awareness of access to critical care services as a problem and earlier treatment of patients on wards who would have previously needed ICU admission, but now no longer do so.

In regard to **CI 1.4**, approximately one-quarter of ICU discharges are delayed more than 6 hours after being deemed ready to leave the ICU. This figure does not appear to have changed much over the past three years, but there is wide variability between HCOs. Many factors may affect the ability to discharge a patient such as definitions used to determine 'readiness to leave ICU', staff and management culture, occupancy of the wards and actual likely time the patient is expected to leave the ICU. Delaying a patient's discharge may be beneficial to that patient if it facilitates transfer to a ward during daylight hours rather than at night. However, leaving an ICU bed occupied by a patient who does not need it may also delay admission of an acutely unwell patient due to lack of an available ICU bed.

After-hours discharge (**CI 1.5**) from ICU has consistently been shown to be associated with increased risk of death so it is pleasing to see a reduction, albeit minor, over the past few years at contributing hospitals. Although there is great variation between sites, after-hours discharge from ICU appears to be a much greater problem for public hospitals.^{1,2}

Intensive care patient management

Over the past three years, there appears to have been an increase in rapid response calls to patients within 72 hours of discharge from ICU

(**CI 2.1**), presently representing 3.5% of all ICU discharges. These are more common in public hospitals and there appears to be considerable variation around the country. This should not necessarily be seen as representing premature discharge of patients who later deteriorate. Changing thresholds for activation of rapid responses through recent introduction of mandatory calling criteria at many hospitals, along with the increasing number of hospitals reporting these CIs, may account for these findings.

Intensive care patient treatment

The failure to provide venous thromboembolism (VTE) prophylaxis (**CI 3.1**) for an ICU patient when indicated is associated with approximately a 20% increase in risk of death. Although local protocols may vary and different interpretations may limit definitive conclusions, it is reassuring to see that the rate has risen significantly over the last several years. Lower rates in some hospitals may still indicate that many patients are not receiving VTE prophylaxis when they should.³

Central line-associated bloodstream infection

The CI-CLABSI rate (**CI 4.1**) has progressively and markedly declined, and is now set below the suggested benchmark maximum of 1 per 1000 line-days for 3 years. It is likely that this represents numerous initiatives to reduce central line-associated bloodstream infection (CLABSI) rates throughout Australia and New Zealand, including feedback mechanisms such as the ANZICS CLABSI reporting system. It is important to note that the case-mix and the actual number of admissions to ICU requiring central lines at some institutions may have a large effect on the CLABSI rate. However, this decline in CLABSI persists even

after adjustment for the changing composition of contributing ICUs.

Few hospitals report infection rates for PI-CLABSIs (**CI 4.2**). There has been little variation in this rate over time and across hospital type. Further interpretation of this CI is limited, although it is notable that for the contributing hospitals the rate of infections in centrally inserted central lines is now lower than the rate reported here for those peripherally inserted.

Utilisation of patient assessment systems

Whilst the proportion of adult ICU admissions reported by contributing hospitals to the ANZICS CORE APD (**CI 5.1**) has gradually increased, there appears to have been a reduction in the number of HCOs reporting this CI to ACHS. The 61 hospitals reporting this CI to ACHS represent less than half of those who actually contribute data to ANZICS CORE. Despite the decline in hospitals reporting this CI, the number of reported ICU admissions has increased indicating the increasing work load within the ICUs at these hospitals. ANZICS would like to see 100% participation by all hospitals. ICUs not reporting at all may conceal safety, quality or performance issues.⁴

Only one of the 44 hospitals reporting to ACHS has not contributed to the ANZICS CORE Critical Care Resources (CCR) Survey (**CI 5.2**), which represents approximately one-quarter of those who do actually contribute information. The CCR survey provides vital information to assess the provision of ICU services throughout Australia and New Zealand. This can only provide accurate information when there is a high rate of participation from the critical care community.



Minimum standards for a rapid response system

The wording and definitions of CIs in this area makes interpretation difficult and may impact on the ability of hospitals to collect and submit these data to ACHS.

Approximately one in four Rapid Response Teams are not coordinated or run by the ICU, so **CI 6.1** may better represent general hospital-wide processes rather than an indicator of ICU performance. In addition, it is unclear if a low rate represents a good or a bad figure. A low rate may represent a small number of patients in need of medical intervention or may represent a failure to respond to patients in need. Similarly, a higher rate at one hospital may just represent a lower threshold for activation of a rapid response call than at another. ANZICS would not recommend using these metrics as indicators of ICU performance at present. These CIs do however potentially provide a marker of the resources employed in looking after critically ill patients outside of the ICU.

Interpretation of **CI 6.2** may be difficult. An RRS call within 24 hours of admission may represent a patient who has either not received appropriate early treatment or who has deteriorated despite treatment. A low rate may represent a small number of patients in need of subsequent medical intervention through an RRS or may represent a failure to provide a response to patients in need of intervention.

CI 6.3 and **6.4** are probably most useful as markers of the impact of a Rapid Response Team within a hospital. A low rate of cardiac arrests may reflect a patient cohort with a low severity of illness, timely provision of palliative care to the terminally ill avoiding unnecessary cardiac arrest calls or early intervention in acutely ill patients averting the actual occurrence of cardiac arrest. The low rate of cardiac arrests and of deaths amongst patients without an NFR order in private hospitals probably reflects the high proportion of patients admitted for elective surgical procedures who are less likely to be at risk of death than emergency admissions. The high rates in outlier hospitals are difficult to interpret without knowledge of compliance with definitions or severity of illness profiles of patients.

No major comment or inference can be drawn from **CI 6.5**. The wide variation seen in the data suggests this is due to factors other than the baseline number of hospital admissions. Of these, the most likely factors determining outcomes will be patients' underlying severity of illness and the case-mix at each hospital. The lower rate in private hospitals almost certainly reflects patients with low severity illness (predominantly elective surgical cases) who are expected to have lower mortality.

References

1. After-hours Discharge from Intensive Care Increases The Risk of Readmission and Death. David Pilcher, Graeme J. Duke, Carol George, Michael Bailey, Graeme Hart *Anaesthesia and Intensive Care* 2007; 35(4): 477-85
2. Centre for Outcome and Resource Evaluation Annual Report 2010-2011, ANZICS Melbourne
3. Omission of early thromboprophylaxis and mortality in critically ill patients: a multicenter registry study. Ho KM, Chavan S, Pilcher D. *Chest*. 2011 Dec;140(6):1436-46. Epub 2011 Sep 22.
4. Pilcher DV, Hoffman T, Thomas C *et al*. Risk-adjusted continuous outcome monitoring with a EWMA chart: could it have detected excess mortality among intensive care patients at Bundaberg Base Hospital? *Crit Care Resusc* 2010; 12(1): 36-41.

Expert Commentary

Australian College of Critical Care Nurses (ACCCN)

Access and exit block

The increase in the number of appropriate adult patients unable to be admitted to an ICU because of inadequate resources (**CI 1.1**) to an annual rate of 2.2 per 100 patients is concerning. This may be somewhat influenced by the reduction by four HCOs reporting on this CI. That

there has also been a reduction in intensive care beds within those reporting HCOs is possible. The rate for public HCOs compared to private HCOs is significantly greater, possibility reflecting the greater control over bed utilisation at private HCOs. Establishing the optimal occupancy for the ICU in each HCO is challenging.¹

The numerator of elective surgical case cancellation due to lack of an ICU bed is very specific in **CI 1.2** to ICU bed usage. While there are five less HCOs contributing to this CI, unfortunately the rate has slipped back to 0.90. This is only a slight improvement on the rate of 0.96 in 2011, when the same number of HCOs contributed.



Elective surgical cases may be deferred for a number of reasons ranging from patient-specific to patient preparation, to operative team availability and resources, to post-operative management, to bed availability either within an acute surgical ward or intensive care unit. Whether the hospital has a recovery unit operational over extended or 24 hours will sometime determine in a tight bed capacity situation whether a patient booked for an ICU bed which is not currently available can have their surgery proceed when the recovery unit can provide short-term back up for this patient. While not ideal, the flexibility this provides can assist in avoiding cancellations where the bed situation is unclear.

The College notes great variation between states. Without information relating to the types of HCOs, these data only show the state's overall position. Victoria particularly has significant improvement in the reduction of surgery cancellations related to lack of an ICU bed.

With similar numbers of HCOs contributing to **CI 1.3**, the transfer of adult ICU patients to another facility due to unavailability of bed, the fitted rate continues to trend down, but the rate increased to 0.96 per 100 patients over the last year resulting in an increased number of patients requiring transfer to another facility for an ICU bed. The transfer of critically ill patients from one facility to another ideally only ever occurs in order to provide the patient with specialised services unavailable at the original facility. To have to transfer a patient to another facility due to unavailability of an ICU bed is to be avoided whenever possible, because of the potential risks associated with transport of a critically ill patient.² If the originating ICU is full of critically ill patients that are not ready for discharge and all the beds are in use, then transferring to another facility is the only option.

Non-availability of beds can include no physical bed space, but also may mean no equipment / ventilator for the bed, or no staff. Although more often than not this refers to nursing staff, it may include medical staff.

There are both hospital and intensive care-based factors and considerations relating to the delay in discharging patients from the ICU for greater than 6 hours (**CI 1.4**).

Hospital-wide patient flow depends upon multiple factors such as discharge processes and times and demand on hospital beds for planned admissions, especially those with procedural plans, e.g. chemotherapy, interventional radiology, operative and procedural bookings, and ED admissions. The need to meet surgical wait-list targets and the 4 hour admission target for the ED may adversely impact on the timing of patient movement out of the ICU – especially if there is no pending demand for the intensive care bed for another patient at the time of decision.

For intensive care, the issues become whether the bed / area can be processed ready for a new patient within an appropriate time period from discharge of the previous patient from ICU and if the processing time is extended to include extra cleaning due to infectious or MRO status of the prior patient occupying the bed. There is also the consideration for nurse staffing as to whether the discharge bed is confirmed for the later time, or is unknown and therefore the patient awaiting discharge needs to be included in nurse staffing calculations for the next shift. While the same number of HCOs contributed to the data, and the overall numbers of patients were greatly increased, there was a slight reduction in the rate of patients with delayed discharge greater than 6 hours. As with access, public hospitals displayed a greater difficulty in meeting this target than private hospitals.

In almost all circumstances, discharging a patient from the ICU between 6pm and 6am (**CI 1.5**) is to be avoided. There may be occasions where after clinical judgement of the particular circumstances – whether they relate to the patient, their condition, the receiving ward or team – it is appropriate to go forward with the discharge from the ICU between these times. Examples may be the planned transfer to a palliative care unit, or to a coronary care unit. For the most part discharging patients from intensive care after 6pm and before 6am is best avoided as the medical staffing during those hours particularly is likely to consist mostly of medical cover, and as such they may not be familiar with the patient's complex history, treatment in ICU or current needs. The small reduction in rate of patients discharged overnight to 14.8 is welcomed after little improvement in this CI over the past few years. However, the risks associated with discharging intensive care patients overnight remain and significant numbers of patients are experiencing this risk. This is most likely reflective of the bed flow complexities and completion for beds that exists in many HCOs. Where transfer of a critically ill patient to another facility might be not desirable or even possible, then the transfer of a patient from intensive care at night might be the option required to be used to provide access for another critically ill patient.



Intensive care patient management

Rapid response calls for patients discharged from intensive care (**CI 2.1**) close to their discharge need investigating to determine the reason for the deterioration, which may include:

- precipitate discharge from intensive care – either from pressures for beds or other resources in the ICU
- unrecognised clinical issues prior to intensive care discharge
- incomplete clinical handover of the discharged patients to the receiving team
- poor planning for ongoing patient monitoring, treatments or care requirements, or
- the rapid response call being caused by a new clinical problem unrelated to the patient's prior admission to intensive care.

The increasing number of liaison nurses in Australian intensive care implemented for ICU patient follow up is testament to the recognition of the complexities of many intensive care patients on discharge from the ICU.

Interpretation of the rate of 3.5 per 100 patients for this CI remains difficult, because not only is this just the third year of data being collected for this CI, but at the same time the changes to how HCOs manage recognition and response to deteriorating patient has been, and still is, undergoing great change. It will be more important for HCOs to examine closely their own data and rate against any changes in practice or systems they have implemented. It may be that the increased rate reflects a more robust system of recognition and response and reporting. Interestingly, Victoria has the highest rate of 5.8 for this CI which may correspond to having an ICU liaison nurse in each hospital with an ICU. This may be extrapolated to the ICU liaison nurses in their post-

ICU follow-up review of these patients are identifying deterioration early and making a RRT referral, compared to other HCOs without post-ICU follow-up services, where deterioration may be reliant on ward staff escalating a RRT call later.³

Intensive care patient treatment

CI 3.1 focuses on a number of process practices in the treatment of intensive care patients: Firstly, the appropriate application of venous thromboembolism (VTE) prophylaxis treatment according to local protocol for all patients admitted to the ICU, and secondly, conducting the assessment for appropriate VTE prophylaxis for each patient and implementing the prophylaxis treatment within 24 hours of admission to the ICU. Many teams in intensive care will have local versions of various checklists for patient admission and ward rounds within the ICU, likely to incorporate consideration for VTE prophylaxis. The 24 hour timeframe for implementation of patient appropriate VTE prophylaxis treatment should be achievable. This timeframe allows for preventive care requirements to be assessed and implemented:

- following resuscitation and other more immediate treatments
- after accessing resources such as anticoagulant medications or appropriately-sized mechanical devices and sleeves or compression stockings.

Access to sequential compression devices may be impeded if the ICU does not have enough equipment resources for each bed within the unit. Loan or consignment may be set up within a hospital to minimise device numbers while maximising access for whole-of-hospital areas. Time to access these centrally held devices should also be achievable within the 24 hour timeframe, unless

the total numbers are inadequate for the hospital population. The improving rate, now 93.6, is encouraging, but it means there are still patients not receiving recommended prophylaxis.

Central line-associated bloodstream infection

The number of HCOs contributing to **CI 4.1** is low compared to previous areas. This may be due to the reporting of this data elsewhere at a more local level in response to ongoing initiatives focused on improvement in central-line management or at a state level. There have been multiple strategies implemented to improve practices for central-line insertion and management over the past years and the decreasing rate, now at 0.51 per 1000 line-days for centrally inserted CLABSI and having no outlier HCOs for this period, is gratifying for those HCOs reporting to this CI.

PI-CLABSI rates for adult ICU patients (**CI 4.2**) are also reduced from last year to 0.70 per 1000 line-days with no outlier HCOs for this CI. However, the number of HCOs contributing to this data set is even less than for CI-CLABSI and so interpretation is limited.

Utilisation of patient assessment systems

The rate for **CI 5.1** is at its highest ever of 95 per 100 admissions, although the number of HCOs contributing to this CI is at its lowest at 61. A key component of this CI is that the data submitted is complete – this enables that dataset to be more confidently examined for trends in results across all parts of the database. There were 13 HCOs with outlier data and an outlier HCO rate of 76.2 per 100 admissions.

CI 5.2 provides an annual snapshot of resources in intensive care throughout Australia and New Zealand.



By examining prior responses, a unit can review evidence of their own resources aligned with activity and any changes can be examined. The number of HCOs responding to this has remained in the low to mid 40s (44 in 2013) for the past 3 years.

Minimum standards for a rapid response system

As for **CI 2.1**, CIs regarding minimum standards for a rapid response system are difficult to interpret as this is only their third year of collection and, during this time, there has been considerable change related to the recognition and response to deteriorating patients. For some HCOs, the management of rapid response teams may be the primary responsibility of the ICU, but in some the ICU teams combine with other personnel, e.g. Anaesthesia.

CI 6.1 is at an increasing rate of 31.9 per 1000 patients. Whether this increasing rate is related to the deterioration in management of patients resulting in more calls, or to earlier recognition of deterioration, or to better systems for response or finally improved reporting of these events, would need to be investigated by the individual HCOs related to their own trends. A low call rate in the setting of a low cardiac arrest rate and low unexpected death rate may indicate that the system is working adequately. For patients not requiring ICU admission post-RRT call, then it can be argued that the RRT is communicating well with the parent team in managing this group of patients in the ward environment. The inclusion of an RRT call criterion such as "worried" provides a patient safety net and can be used as an opportunity for training a less experienced workforce. As the workforce becomes increasingly skilled in managing deteriorating patients then this criterion may be less utilised.

The number of HCOs contributing to data for **CI 6.2** has increased in 2013, but is still only 43 HCOs compared to 60 for the previous CI of total number of rapid response system calls. The annual rate of 7.6 per 1000 patients has increased since collection of this CI began, but as with all the CIs within this area, whether this reflects the acuity of the patients admitted and the time to treat or deterioration despite treatment is unclear. Comparing this rate against a decreasing rate for adult patients experiencing cardiopulmonary arrest within a HCO would seem a positive outcome. This is an important CI in relation to the 4 hour rule in the ED. A high call rate within 24 hours of admission to hospital may reflect sub-optimal triage in the emergency department with inadequate treatment of deterioration. Many of these patients are then reviewed by junior medical staff on the wards and might not have senior medical review until the next ward round, resulting in a high RRT rate within the first 24 hours. It would be interesting to see if this rate changed for those patients who received senior medical review within 4 hours of being admitted to the ward.

The annual rate of 1.2 per 1000 patients for **CI 6.3** is from 54 HCOs. The examination of this rate by individual HCOs over time and against their hospital patient acuity is most useful. The reason for the difference in numbers is that the RRT may not attend all codes, such as those in intensive care, operating rooms or coronary care, therefore there may be a proportion of inpatient cardiac arrests not being captured. One could argue that a cardiac arrest in a critical care area does not involve the RRT and therefore should be excluded from this CI dataset.

CI 6.4 will be influenced by the HCO case-mix, practice processes relating to limitations to treatment or do-not-resuscitate orders as well as by the involvement of palliative care teams. With hospitals which have a large palliative care unit, this may be reflected in that HCO's numbers. The number of patients who did not have a documented NFR/DNR order will include potentially avoidable deaths and/or completely unexpected deaths. Only on review of these patient records, including observation charts, may it be discovered that there was a plan to have no escalation of care as part of an end-of-life care plan although a documented NFR/DNR order was not in place, or that the patient had previously reached escalation criteria with local management only, but no RRT call. RRS calls will still encompass calls for patients with limitations to treatment plans, not necessarily NFR orders, but as a result of the deterioration progress to palliation may occur.

The variation of **CI 6.5** undoubtedly relates to the severity of illness of admitted patients or the case-mix of the HCO and this CI is better interpreted by the HCOs.

References

1. Tierney LT, Conroy KM. Optimal occupancy in the ICU: A literature review. *Aust Crit Care* (2014), <http://dx.doi.org/10.1016/j.aucc.2013.11.003>
2. Flabouris A, Runciman WB, Levings B. Incidents During Out-of Hospital Patient Transportation. *Anaesth Intensive Care* 2006; 34:228-236
3. Elliott M, Worrall-Carter L, Page K. Factors contributing to adverse events after ICU discharge: A survey of liaison nurses. *Australian Critical Care* 26 (2013) 76 – 80



Expert Commentary

College of Intensive Care Medicine (CICM)

Introductory comments

It is gratifying to note that for the majority of Intensive Care CIs, performance has steadily improved over recent years. Central collection and analysis of these grouped data are clearly important to gain an appreciation of quality management across Australia. However, for most CIs there is a significant outlier rate suggesting that performance could be further improved if outlier HCOs are able to address the issues responsible for the outlier status. For example, those HCOs that are outliers for VTE prophylaxis should review their practice internally. If all CIs for access block show that resources are limited, HCOs should act to resolve the problem.

Access and exit block

The rate of **CI 1.1** has decreased over the past eight years and may have stabilised recently. It is approximately four times higher in the public sector than in private HCOs, and the majority of outlier HCOs are public.

The inability to access ICU care can result in adverse patient outcomes¹ and therefore, the overall trend is pleasing. Contributing factors to the improvement include an overall increase in ICU beds, increasing use of Rapid Response Teams (RRTs) who may stabilise patients in ward areas so that ICU admission is not required and adoption of systems to decrease access block because of increased awareness.

As with other ICU CIs related to access and exit block (**CIs 1.4** and **1.5**), the much higher rate in public HCOs is likely to be the result of a more acute, non-elective patient population whose need for ICU admission cannot be planned as is often the case in private HCOs. Access block can be related to exit block (**CI 1.4**).

As with **CI 1.1**, the rate of **CI 1.2** has fallen over the past year and for similar reasons. Other factors may include a reduction in discharge delay, improvements in ICU bed management (such as staged admission times) and advances in surgical techniques (such as laparoscopic surgery) that allow safe post-operative management outside of the ICU.

The highest rates occurred in Queensland hospitals, possibly reflecting an inadequate number of staffed and equipped ICU beds in that state or a mal-distribution of resources.

CI 1.3 has also progressively decreased (improved) over the past eight years, but more gradually than the first two CIs. As with **CIs 1.1** and **1.2**, this CI is a reflection of deficient staffed and equipped ICU beds in a particular HCO. All three CIs have shown a decline that indicates that access to ICU is improving. Patients who require transfer to another facility are those who cannot be managed on a general ward, usually because of a requirement for ventilation and/or vasoactive medications. These patients are often transferred directly from emergency departments and consequently this CI is less likely to be influenced by improved access to RRTs and ICU outreach. As with the previous CI, most outlier HCOs were in Queensland. Outliers seemed to be fairly evenly distributed between HCOs with the largest and smallest number of ICU discharges.

The rate of **CI 1.4** has remained fairly steady over the past three years. On average, one in four patients has an ICU discharge that is delayed using this definition. The rate is around seven times higher in public HCOs reporting this CI. In outlier HCOs every second patient discharged from ICU had exit block.

Discharge delay is primarily the result of inadequate resources on hospital wards and/or the hospital selectively admitting patients from the ED or elective surgical admissions to the wards. High rates are not necessarily a problem for the quality of care within ICUs unless it results in access block or the delay causes ICU discharges between 6pm and 6am (**CI 1.5**). It may also have major cost implications for ICUs and potentially redirects funds away from critically ill patients who need the service. This bed pressure in hospital wards is far more likely to occur in public hospitals, in which emergency admissions are more common, than in the private sector where the case-mix is more elective and predictable.

CI 1.5 has improved consistently but slowly since its introduction in 2007, such that in 2013 approximately 15% of all patients discharged from ICU were discharged after hours.

After-hours discharges from ICU occur when there is an imperative to admit patients to the ICU after hours. This is more likely to occur in public HCOs that have greater numbers of emergency admissions than in private HCOs that have a more stable elective surgery case-mix. The fact that this CI has changed little whilst **CIs 1.1**, **1.2** and **1.3** have decreased suggests that ICUs in busy HCOs are using after-hours discharge as a means of maintaining access to the ICU, so that patients are not refused admission, have their surgery cancelled or transferred to another facility. Despite the evidence that after-hours discharge is associated with more adverse outcomes², it is unlikely that all HCOs will have sufficient empty but staffed beds at 6pm to allow overnight admission of all patients potentially requiring ICU management. This means it is likely this strategy will continue.



The rate of after-hours discharge could be reduced by increasing ICU resources between 6pm and 6am, but this would have major organisational and cost implications. Other approaches could involve accepting that some level of after-hours discharge is inevitable, and increasing the resources for the patient following discharge from the ICU.

Intensive care patient management

In 2013, 56 HCOs provided data for **CI 2.1** – 10 more than the two previous years when this CI was introduced. The rate has increased over the three years to 3.5 per 100 patients discharged from the ICU. It is nearly five times higher in public HCOs than in private HCOs, and higher in Victoria than in other states.

It is not clear what the optimum rate of rapid response calls should be after ICU discharge. Clearly it is desirable for the rate of rapid response calls to be low providing there are no cardiac arrest calls or unplanned deaths. If the rate is high and there are no cardiac arrest calls or unplanned deaths then one could argue that the team is doing its job and that possibly ICU discharge is premature. This is difficult to determine as the threshold for calling a rapid response team varies from HCO to HCO. If the rate is low in the face of unplanned deaths then it must be assumed that there are problems with the rapid response system.

Outlier ICUs tended to have a greater number of discharges and consequently could have a greater pressure to discharge early, better established rapid response teams or both.

Intensive care patient treatment

The overall rate for **CI 3.1** continues to improve towards 100% of patients receiving VTE prophylaxis within 24 hours of admission to ICU. Thirty-five per cent of HCOs were outliers and in this group only 80.6% patients received timely VTE prophylaxis. These outlying ICUs are both large and small units. The reasons for this significant deviation from conventional practice are unclear, but practice in these ICUs need to be addressed before the overall rate can be improved further.

Central line-associated bloodstream infection

The rate of **CI 4.1** continues to fall from a fitted rate of 2.5 per thousand line-days in 2006 to a low of 0.60 in 2013. It is likely that a major part in this improvement is adoption of checklists and guidelines designed to prevent these infections. Only 72 submissions were received from 41 HCOs. This is likely to reflect the high level of resources needed to collect line-days, particularly in patients who have been discharged from the ICU.

The rate of **CI 4.2** has remained relatively stable since 2006 at 0.70 per 1000 line-days. Only 52 submissions were reported from 29 HCOs. The likely reason why fewer ICUs choose to collect **CI 4.2** than **CI 4.1** is that the majority of patients having peripherally inserted central lines are not ICU patients, but general ward patients (usually inserted in the radiology department). Consequentially, it is questionable whether this CI assesses quality of care in the ICU.

Utilisation of patient assessment systems

The rate of **CI 5.1** has increased slightly to an annual rate of 95 patients with data submitted per 100 patients admitted to the ICU. The 13 outlier HCOs had a rate of 76.2 per 100 patients. It is not clear why this rate is not 100%, but inadequate resources for data collection, a need / wish to collect alternative data, or other factors may be involved. Interestingly, the number of HCOs submitting data for this CI has fallen from 75 to 61 over the past eight years.

It is difficult to comment on **CI 5.2** except to say that in each of the last two years one HCO did not take part in the survey. It seems that the remaining 43 reporting HCOs did take part. However, a number of HCOs did not submit for this CI.

Minimum standards for a rapid response system

As was the case last year, there is a large difference between the 20th and 80th centiles for **CI 6.1** suggesting there is significant variability in the rate of rapid response team (RRT) calls around the country. The mean annual rate was 31.9 per 1000 patients

One of the major reasons for the variation in rate between HCOs is that the criteria for calling a RRT are not standard across all HCOs. The introduction of colour-coded observation and response charts has addressed this to some extent, but most organisations have a 'nurse worried' criterion for calling the team which can be quite individual.



It is not specified whether a high or low rate of RRS calls is desirable. This is because the rate of calls is to some extent irrelevant in isolation. The more important data are the rates of cardiac arrest calls and unplanned deaths. Also important is the proportion of patients that are moved to a higher level of care as a result of the RRS call. It could be argued that if the rate of transfer to a higher acuity environment is low, then excess calls are being made, with associated resource implications. HCOs should audit RRS calls to determine whether calls are being made appropriately.

The rate of **CI 6.2** is much lower than the general rate (**CI 6.1**) and has less variability. However, only 43 HCOs submitted records for this CI compared with 60 for **CI 6.1**. This may be because accurate data on time from admission can be difficult to collect.

It is not clear why the rate for this CI is approximately a quarter of the general rate. It may reflect well-functioning triage systems so that patients at risk of RRT calls are admitted to high acuity areas. The desired rate for this CI is not known.

The overall rate for **CI 6.3** was 1.2 per 1000 and was similar to the rates for the two previous years. However, there is a number of outlier HCOs where the rates are significantly increased. The most likely reason for this is that the 'deterioration' that usually occurs before cardiac arrest has been inadequately tracked in these HCOs and that RRS calls have not been made, or have been made too late, to prevent cardiac arrest. Consequently, there is room for improvement in this CI if the RRS can be improved.

Clearly, case-mix is important. Patients of each HCO may have different degrees of illness severity and this is the likely reason why the rate of cardiac arrests is lower in the private sector than in public HCOs. Nevertheless, if the RRS is functioning optimally it should be capable of reducing the rate of cardiac arrest in patients with all degrees of illness severity, either by escalating care or by documenting 'not for resuscitation' if the situation is irretrievable.

The rate of **CI 6.4** was 1.1 per 1000 patients and similar to the rates for the past two years. Only 28 HCOs submitted records. Where NFR orders are applied appropriately, deaths in adult patients without NFR orders reflect the unexpected death rate. Some of these unexpected deaths will actually be preventable deaths. Because the majority of patients in private hospitals have a very low risk of death, it is not surprising that the non-NFR death rate is higher in public than in private HCOs. Clearly in some institutions a high rate may reflect deficiencies in NFR policies or lack of compliance with NFR policies rather than an elevated number of unexpected deaths.

The rate of **CI 6.5** was 11.7 per 1000 patients and similar to the rates for the past two years. Only 45 HCOs submitted data for this CI. The rate of deaths in HCOs is the sum of the expected (NFR deaths) and unexpected (non-NFR deaths). The rate of expected deaths is related to HCO admission policies, patient case-mix, etc., and is not in itself a quality CI. It may simply reflect the fact that many Australians die in a hospital. As the patient mix in private HCOs is principally well patients having elective surgery with a low risk of death, it is not surprising that the rate of deaths in private HCOs is approximately a third of that in the public sector.

The overall death rate in this CI is much higher (approximately nine times) than the non-NFR death rate in both public and private HCOs. This suggests that the majority of patients dying in HCOs have terminal illnesses and are expected to die.

References

1. Duke GJ, Buist MD, Pilcher D *et al.* Interventions to circumvent intensive care access block: a retrospective 2 year study across metropolitan Melbourne. *Med J Aust* 2009 190(7):375-378
2. Pilcher DV, Duke GJ, George C *et al.* After-hours discharge from intensive care increases the risk of readmission and death. *Anesth Intensive Care* 2007; 25(4):477-485



300

600

900

1200

1500

$\approx V_T$ (mL) \triangle





Internal Medicine

VERSION 5

Cardiovascular disease

CI 1.1 CHF – prescribed ACEI or A2RA (H) In 2013, there were 72 patients reported from three healthcare organisations (HCOs). The annual rate was 75.0 per 100 patients. There were no potential gains in 2013.

CI 1.2 CHF – prescribed beta blocker (H) In 2013, there were 48 patients reported from one HCO. The annual rate was 87.5 per 100 patients. There were no potential gains in 2013.

CI 1.3 CHF and AF – prescribed warfarin (H) In 2013, there were 29 patients reported from one HCO. The annual rate was 82.8 per 100 patients. There were no potential gains in 2013.

CI 1.4 CHF – chronic disease management referral that includes rehabilitation (H) In 2013, there were 81 patients reported from two HCOs. The annual rate was 24.7 per 100 patients. The potential gains totalled nine more patients referred for a chronic disease management service that included physical rehabilitation.

CI 1.5 AMI – thrombolysis within 1 hour of presentation (H) In 2013, there were 77 patients reported from seven HCOs. The annual rate was 74.0 per 100 patients. There was no significant trend in the fitted rate. There were no potential gains in 2013.

CI 1.6 PTCA – vessels where primary success achieved (H) In 2013, there were 5,518 vessels reported from 14 HCOs. The annual rate was 96.3 per 100 vessels. There was no significant trend in the fitted rate. There was relatively little variation between HCOs and so the potential gains were small in 2013.

CI 1.7 PTCA – CABG within 24 hours (L) In 2013, there were 4,734 inpatients reported from 15 HCOs. The annual rate was 0.15 per 100 inpatients. The fitted rate improved from 0.40 to 0.11, a change of 0.29 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.20 per 100 inpatients. There was relatively little variation between HCOs and so the potential gains were small in 2013.

Endocrine disease

CI 2.1 Diabetes – lower limb assessment (H) No HCOs submitted data for 2011, 2012 or 2013.

CI 2.2 Elective insulin treated diabetes – at least 4 BSLs during first post-operative day (H) In 2013, there were seven inpatients reported from one HCO. The annual rate was 100 per 100 inpatients. There were no potential gains in 2013.

Acute stroke management

CI 3.1 Acute stroke – swallowing screen prior to food or fluid intake (H) In 2013, there were 830 inpatients reported from 13 HCOs. The annual rate was 64.1 per 100 inpatients. The fitted rate deteriorated from 85.7 to 65.4, a change of 20.3 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 18.7 per 100 inpatients. In 2013, the potential gains totalled 168 more inpatients having documented evidence of a swallowing screen. There were two outlier records from one HCO whose combined excess was 52 fewer inpatients having documented evidence of a swallowing screen. The outlier HCO rate was 22.1 per 100 inpatients.

CI 3.2 Acute stroke – brain scan within 24 hours of presentation (H) In 2013, there were 1,509 inpatients reported from 19 HCOs. The annual rate was 93.5 per 100 inpatients. There was no significant trend in the fitted rate. The potential gains totalled 78 more patients having a documented scan within 24 hours. There were three outlier records from three HCOs whose combined excess was 31 fewer patients having a documented scan within 24 hours. The outlier HCO rate was 73.6 per 100 inpatients.

CI 3.3 Acute stroke – physiotherapy assessment within 48 hours of presentation (H) In 2013, there were 836 inpatients reported from 13 HCOs. The annual rate was 77.9 per 100 inpatients. There was no significant trend in the fitted rate. The potential gains totalled 113 more patients having physiotherapy assessment within 48 hours. There were three outlier records from two HCOs whose combined excess was 40 fewer patients having physiotherapy assessment within 48 hours. The outlier HCO rate was 49.7 per 100 inpatients.



CI 3.4 Ischaemic stroke – receipt of aspirin within 48 hours of presentation (H) In 2013, there were 660 inpatients reported from 12 HCOs. The annual rate was 72.9 per 100 inpatients. There was no significant trend in the fitted rate. The potential gains totalled 70 more patients receiving aspirin within 48 hours. There was one outlier record from one HCO whose combined excess was nine fewer patients receiving aspirin within 48 hours. The outlier HCO rate was 37.5 per 100 inpatients.

CI 3.5 Ischaemic stroke presenting within 4.5 hours – intravenous thrombolysis (H) In 2013, there were 109 inpatients reported from 12 HCOs. The annual rate was 44.0 per 100 inpatients. The potential gains totalled 37 more patients with documented evidence that an intravenous thrombolysis agent was administered.

CI 3.6 Acute stroke – documented plan for ongoing care provided prior to discharge (H) In 2013, there were 387 inpatients reported from nine HCOs. The annual rate was 63.3 per 100 inpatients. The potential gains totalled 82 more patients with evidence of a documented plan prior to discharge. There were two outlier records from one HCO whose combined excess was 46 fewer patients with evidence of a documented plan prior to discharge. The outlier HCO rate was 3.5 per 100 inpatients.

CI 3.7 Acute stroke – administered antihypertensive medication prior to discharge (H) In 2013, there were 636 inpatients reported from 10 HCOs. The annual rate was 87.4 per 100 inpatients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There was one outlier record from one HCO whose combined excess was eight fewer patients who were prescribed and administered antihypertensive medication prior to discharge. The outlier HCO rate was 72.4 per 100 inpatients.

CI 3.8 Acute stroke – treatment in a stroke unit at any time during hospital stay (H) In 2013, there were 759 inpatients reported from 11 HCOs. The annual rate was 72.7 per 100 inpatients. The potential gains totalled 191 more patients that had documented treatment in a stroke unit. There were four outlier records from three HCOs whose combined excess was 110 fewer patients that had documented treatment in a stroke unit. The outlier HCO rate was 26.0 per 100 inpatients.

Aged care

CI 4.1 Medical patients aged 65 or more – cognition assessment (H) In 2013, there were 3,686 patients reported from seven HCOs. The annual rate was 62.6 per 100 patients. The fitted rate deteriorated from 75.6 to 67.7, a change of 7.9 per 100 patients. The potential gains totalled 640 more patients who had their cognition assessed. There were six outlier records from four HCOs whose combined excess was 331 fewer patients who had their cognition assessed. The outlier HCO rate was 34.4 per 100 patients.

CI 4.2 Geriatric patients – assessment of physical function documented (H) In 2013, there were 2,950 patients reported from five HCOs. The annual rate was 79.3 per 100 patients. The fitted rate improved from 89.9 to 92.8, a change of 2.9 per 100 patients. The potential gains totalled 545 more patients having documented objective assessment of physical function. There were three outlier records from two HCOs whose combined excess was 207 fewer patients having documented objective assessment of physical function. The outlier HCO rate was 52.3 per 100 patients.

CI 4.3 Medical patients aged 65 or more – vitamin D prescribed for deficiency (H) In 2013, there were 228 patients reported from one HCO. The annual rate was 100 per 100 patients. There were no potential gains in 2013.

Respiratory disease

CI 5.1 COPD – chronic disease management service referral (H) In 2013, there were 62 patients reported from three HCOs. The annual rate was 25.8 per 100 patients. The potential gains totalled 29 more patients who were referred for chronic disease management that included physical rehabilitation.

CI 5.2 Acute asthma – initial severity assessment documented (H) In 2013, there were 64 patients reported from four HCOs. The annual rate was 90.6 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There was one outlier record from one HCO whose combined excess was three fewer patients for whom there was objective assessment of severity on initial presentation. The outlier HCO rate was 60.0 per 100 patients.



CI 5.3 Acute asthma – ongoing severity assessment documented (H)

In 2013, there were 89 patients reported from four HCOs. The annual rate was 91.0 per 100 patients. The potential gains totalled six more patients for whom there was objective assessment of severity, in addition to the initial assessment. There was one outlier record from one HCO whose combined excess was three fewer patients for whom there was objective assessment of severity, in addition to the initial assessment. The outlier HCO rate was 50.0 per 100 patients.

CI 5.4 Acute asthma – documented evidence of an appropriate discharge plan (H)

In 2013, there were 131 patients reported from six HCOs. The annual rate was 78.6 per 100 patients. The fitted rate improved from 56.2 to 80.7, a change of 24.5 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 16.6 per 100 patients. There were no potential gains in 2013.

Gastrointestinal disease

CI 6.1 Haematemesis / melaena with blood transfusion – gastroscopy within 24 hours (H)

In 2013, there were 30 patients reported from three HCOs. The annual rate was 53.3 per 100 patients. There were no potential gains in 2013.

CI 6.2 Haematemesis / melaena with blood transfusion – cause of bleeding diagnosis (H)

In 2013, there were 144 patients reported from three HCOs. The annual rate was 75.0 per 100 patients. There were no potential gains in 2013.

CI 6.3 Haematemesis / melaena with blood transfusion – surgical staff notification (H)

In 2013, there were 287 patients reported from two HCOs. The annual rate was 27.2 per 100 patients.

CI 6.4 Haematemesis / melaena with blood transfusion – operation (N)

In 2013, there were 138 patients reported from two HCOs. The annual rate was 5.8 per 100 patients.

CI 6.5 Haematemesis / melaena with transfusion and endoscopic therapy – operation (N) In 2013, there were 138 patients reported from two HCOs. The annual rate was 2.2 per 100 patients.

CI 6.6 Haematemesis / melaena with blood transfusion – death (L) In 2013, there were 129 patients reported from one HCO. The annual rate was 1.6 per 100 patients. There were no potential gains in 2013.

Renal disease

CI 7.1 Renal biopsy – macroscopic haematuria within 24 hours of procedure (L)

In 2013, there were 499 inpatients reported from six HCOs. The annual rate was 1.8 per 100 inpatients. The fitted rate improved from 5.9 to 1.9, a change of 4.0 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 4.0 per 100 inpatients. There were no potential gains in 2013.

Oncology

CI 8.1 Pre-menopausal patients with Stage II breast carcinoma – poly-chemotherapy (H)

In 2013, there were 25 patients reported from two HCOs. The annual rate was 100 per 100 patients. There were no potential gains in 2013.



Medication Safety

VERSION 3

Reporting mechanisms

CI 1.1 Adverse drug reactions reported to OPC, TGA (N) In 2013, there were 762,043 drug reactions reported from 86 HCOs. The annual rate was 0.14 per 100 drug reactions. The fitted rate increased from 0.11 to 0.13, a change of 0.022 per 100 separations.

Medication errors

CI 2.1 Medication errors – adverse event requiring intervention (L) In 2013, there were 8,301,030 bed days reported from 233 HCOs. The annual rate was 0.011 per 100 bed days. The fitted rate improved from 0.068 to 0.012, a change of 0.056 per 100 bed days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.053 per 100 bed days. In 2013, the potential gains totalled 793 fewer medication errors resulting in an adverse event requiring intervention, corresponding to a reduction by approximately four-fifths. There were 23 outlier records from 18 HCOs whose combined excess was 435 more medication errors resulting in an adverse event requiring intervention. The outlier HCO rate was 0.050 per 100 bed days.

Documentation of known adverse drug reactions

CI 3.1 Known ADRs documented in current medication chart (H) In 2013, there were 15,519 patients reported from 57 HCOs. The annual rate was 90.6 per 100 patients. The fitted rate improved from 78.8 to 92.8, a change of 13.9 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 14.3 per 100 patients. In 2013, the potential gains totalled 1,237 more patients whose known adverse drug reactions were documented on the current medication chart. There were 23 outlier records from 17 HCOs whose combined excess was 700 fewer patients whose known adverse drug reactions were documented on the current medication chart. The outlier HCO rate was 67.5 per 100 patients.

Medication orders with error-prone abbreviations

CI 4.1 Medication orders that include error-prone abbreviations (L) In 2013, there were 53,307 medication orders reported from 27 HCOs. The annual rate was 4.5 per 100 medication orders. The fitted rate improved from 9.4 to 3.2, a change of 6.2 per 100 medication orders. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 6.5 per 100 medication orders. In 2013, the potential gains totalled 1,485 fewer medication orders that included error-prone abbreviations, corresponding to a reduction by approximately one-half. There were 11 outlier records from seven HCOs whose combined excess was 873 more medication orders that included error-prone abbreviations. The outlier HCO rate was 12.5 per 100 medication orders.

Warfarin management

CI 5.1 Warfarin – abnormal bleeding (L) In 2013, there were 1,926 separations reported from 21 HCOs. The annual rate was 1.5 per 100 separations. The fitted rate deteriorated from 0.30 to 1.4, a change of 1.1 per 100 separations. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.93 per 100 separations. In 2013, the potential gains totalled 21 fewer patients receiving warfarin as an inpatient who experienced abnormal bleeding, corresponding to a reduction by approximately two-thirds. There were two outlier records from one HCO whose combined excess was 12 more patients receiving warfarin as an inpatient who experienced abnormal bleeding. The outlier HCO rate was 4.4 per 100 separations.

CI 5.2 Warfarin – INR / prothrombin reading exceeded 5 (L) In 2013, there were 7,542 separations reported from 24 HCOs. The annual rate was 1.8 per 100 separations. The fitted rate improved from 4.3 to 2.4, a change of 1.8 per 100 separations. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.6 per 100 separations. There were no potential gains in 2013. There was one outlier record from one HCO whose combined excess was 13 more patients receiving warfarin as an inpatient with an INR reading greater than 5. The outlier HCO rate was 3.4 per 100 separations.



CI 5.3 Warfarin – written drug information upon discharge (H)

In 2013, there were 1,006 patients reported from 16 HCOs. The annual rate was 83.7 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 155 more patients discharged on warfarin who received written drug information prior to discharge. There were ten outlier records from seven HCOs whose combined excess was 102 fewer patients discharged on warfarin who received written drug information prior to discharge. The outlier HCO rate was 27.1 per 100 patients.

CI 5.4 Warfarin – dosage review following high INR result (H) In 2013, there were 239 patients reported from 19 HCOs. The annual rate was 99.2 per 100 patients. There was no significant trend in the fitted rate. There were no potential gains in 2013.

CI 5.5 Warfarin – starting doses consistent with hospital approved protocol (H)

In 2013, there were 182 patients reported from eight HCOs. The annual rate was 76.9 per 100 patients. The potential gains totalled 34 more patients whose starting doses of warfarin were consistent with a hospital approved protocol.

Aminoglycoside monitoring

CI 6.1 Aminoglycoside toxicity – dosage adjustment prior to next dose (H)

In 2013, there were 14 patients reported from two HCOs. The annual rate was 100 per 100 patients. There were no potential gains in 2013.

Expert Commentary

Therapeutic Goods Administration (TGA)

Introductory comments

The TGA's Office of Product Review (OPR) is a part of the Monitoring and Compliance Group. It is responsible for ongoing post-market monitoring of all therapeutic goods, including medicines (e.g. prescription, over-the-counter and complementary medicines), vaccines, biologicals and medical devices.

The OPR protects public health and safety by ensuring therapeutic goods supplied in Australia maintain appropriate levels of quality, safety and efficacy / performance, and that advertising of therapeutic goods is done in accordance with applicable laws and regulations. When necessary, the OPR takes appropriate regulatory actions (e.g. recall actions).

The OPR works closely with stakeholders, including consumers, health professionals, industry, government and international counterparts, to ensure that the

regulatory framework within which it operates is able to adapt to the latest scientific developments and emerging community expectations. It is committed to ongoing improvement in these processes to maximise the effectiveness and efficiency of the TGA's post-market monitoring activities.

Documentation of known adverse drug reactions (CI 3.1) is outside the TGA's purview. Also, as a regulatory agency, the TGA is unable to comment on medications with error-prone abbreviations (CI 4.1). The Quality Use of Medicines is one of the central objectives of Australia's National Medicines Policy – a well-established endorsed framework based on partnerships. Governments – Commonwealth, states and territories – health educators, health practitioners, and other healthcare providers and suppliers, the medicines industry, healthcare consumers and the media work together to promote the objectives of the policy.

In this context, the TGA supports the continued collection and reporting of data related to medication safety.

Reporting mechanisms

Data on adverse events collected by the TGA between 2006 and 2013 reflect a similar rate of reporting by HCOs as shown in CI 1.1. During this time period, the rate of reporting has remained relatively consistent, with a slight increase in the rate over the last four years.

The slight increase in the rate of reports over this time period may be reflective of a range of activities the TGA has undertaken to encourage improved reporting of adverse events across all categories of reporters and for all therapeutic goods.



In 2013, the TGA launched the Early Warning System.¹ As part of this system, the TGA publishes monitoring communications – early communications regarding potential safety concerns currently being investigated that encourage further reporting of related adverse events.

Medication errors

After a peak in 2007 and a decline over the following three-year period, the rate for **CI 2.1** has remained relatively low and constantly below the 20th centile rate for the last three years.

The TGA seeks information from a variety of sources when monitoring the safety of therapeutic goods. In particular, the TGA promotes quality use of medicines and encourages all hospitals to have systems in place to ensure that adverse events are identified and reported, both internally and to the TGA.

Such reports are particularly important to the TGA for a number of reasons:

- HCOs have early experience with new medicines and/or their use in people with co-morbidities who would be excluded from clinical trials, and therefore may detect new signals.
- Patients may present to a HCO following a serious adverse event.

The TGA also encourages individual health professionals to report adverse events.

As part of its Blueprint Reforms², the TGA continues to investigate barriers to reporting, as well as develop mechanisms to make submitting ADRs faster, easier and more integrated into existing work systems, such as online reporting facilities.

Warfarin management

The TGA is concerned that the annual rate of non-same day separations receiving warfarin as an inpatient who experienced abnormal bleeding (**CI 5.1**) increased from 0.33 per 100 separations in 2012 to 1.51 per 100 separations in 2013. However, the 2012 result was markedly decreased from the rate in 2011, which was 1.79 per 100 separations. It is not clear to the TGA why variations between years are occurring. As three new oral anticoagulants (NOACs), dabigatran, rivaroxaban and apixaban, are now widely available, including the monitoring of these newer medicines in this set should be considered.

The TGA encourages the collection of data on reporting rates of warfarin, and the NOACs, but has no specific comment on these CIs (**CIs 5.1–5.5**).

Aminoglycoside monitoring

The limited amount of data submitted for **CI 6.1** makes it difficult to make a specific comment. The potential for these medicines to exacerbate morbidity and mortality does need to be monitored. As with anticoagulant medicines, the collection of data on adverse events rising from the use of other new antibiotics entering the market is encouraged by the TGA.

The TGA suggests that a larger number of HCOs be encouraged to collect data on this CI.

References

1. Therapeutic Goods Administration (TGA). Early Warning System. Canberra ACT; Australian Dept of Health. Accessed from www.tga.gov.au/safety/ews.htm . 19 May 2014.
2. Therapeutic Goods Administration (TGA). TGA reforms: A blueprint for TGA's future. Canberra ACT; TGA; 2011. Accessed from www.tga.gov.au/about/tga-reforms-blueprint.htm. 19 May 2014.



Mental Health Community Based

VERSION 2

Community

CI 1.1 Registered consumers seen face-to-face by the community service (N) In 2013, there were 81,319 consumers reported from 16 HCOs. The annual rate was 85.0 per 100 consumers. The fitted rate increased from 75.6 to 84.3, a change of 8.7 per 100 consumers.

CI 1.2 Consumers or nominated carers with greater than 24 treatment days (N) In 2013, there were 55,993 consumers reported from 13 HCOs. The annual rate was 16.8 per 100 consumers. The fitted rate increased from 3.7 to 19.8, a change of 16.1 per 100 consumers. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 13.0 per 100 consumers.

CI 1.3 Consumers / Carers – at least 3 face-to-face contacts within 7 day period (N) In 2013, there were 68,186 consumers reported from 13 HCOs. The annual rate was 33.8 per 100 consumers. The fitted rate increased from 18.2 to 25.6, a change of 7.5 per 100 consumers.

CI 1.4 Consumers – admitted for psychiatric reasons in first year of treatment (L) In 2013, there were 31,553 consumers reported from 10 HCOs. The annual rate was 15.9 per 100 consumers. The fitted rate deteriorated from 12.7 to 13.5, a change of 0.84 per 100 consumers. The potential gains totalled 2,130 fewer consumers who

were admitted to hospital for psychiatric reasons in the first year of treatment, corresponding to a reduction by approximately one-third. There were seven outlier records from five HCOs whose combined excess was 1,209 more consumers who were admitted to hospital for psychiatric reasons in the first year of treatment. The outlier HCO rate was 25.9 per 100 consumers.

Care planning

CI 2.1 Consumers – current completed care plans (H) In 2013, there were 8,420 consumers reported from five HCOs. The annual rate was 20.3 per 100 consumers. The potential gains totalled 5,691 more consumers with current completed care plans. There were two outlier records from two HCOs whose combined excess was 571 fewer consumers with current completed care plans. The outlier HCO rate was 5.7 per 100 consumers.

CI 2.2 Carers involved in developing care plans (H) In 2013, there were 8,025 consumers reported from four HCOs. The annual rate was 5.5 per 100 consumers. The potential gains totalled 2,344 more carers involved in developing care plans. There were two outlier records from two HCOs whose combined excess was 139 fewer carers involved in developing care plans. The outlier HCO rate was 2.4 per 100 consumers.

Expert Commentary

Royal Australian and New Zealand College of Psychiatrists (RANZCP)

Community

CI 1.1 is the measurement of face-to-face contact with consumers registered with the community service. The trend shows a gradual improvement with a rate of 85 in 2013. The flip-side of this finding is that 15% of registered consumers were not seen by the service; clearly there is further room for improvement. Any interpretation of these data should be qualified however as, in common with the other community data, the number of HCOs which contributed data is small; 16 in 2013.

CIs 1.2 and 1.3 are concerned with the intensity of service delivery; both show upward trends. In 2013, 16.8% of consumers / carers seen received >24 treatment days in a 3 month period, equivalent to an average of 2 treatment days per week.

CI 1.3 looks at intensity of service provision over a shorter time scale. In 2013, one in three consumers / carers who were seen by the service received 3 or more face-to-face contacts in a 7-day period.

CI 1.4 considers hospital admission rates of consumers registered with the community service. In 2013, 15.9% of consumers were admitted to hospital at least once in their first year of treatment. This rate is higher than in previous years, however the trend is fairly constant. Again the number of HCOs contributing data is not large; ten contributed data in 2013. While a lower rate of admission would be considered evidence of effective community treatment, a significant admission rate is to be expected in this group, particularly



if admission has been required prior to registration, a not uncommon scenario for consumers seen by public community services.

Care planning

CIs 2.1 and **2.2** consider consumer and carer involvement in care planning. They are important CIs of recovery oriented practice. In 2013, one in five registered consumers had a current completed care plan in which they had been involved and had signed while slightly more than one in 20 had a care plan which their carers had been involved in developing.

While the number of HCOs contributing data to these CIs is small (five contributed to **2.1** and four to **2.2**), the findings are concerning.

General comments

In recent years the RANZCP, along with other organisations, has emphasised the importance of consumer and carer involvement in care planning.^{1,2} At this point the data, which are limited, are yet to show that these initiatives have translated to changes in practice.

References

1. RANZCP Position Statement: Supporting Carers in the Mental Health System, RANZCP, December 2012, see: www.ranzcp.org/Files/Resources/76-Support-for-carers-in-the-mental-health-sys.aspx
2. RANZCP Position Statement: Carer and Consumer engagement, RANZCP, June 2010, see: www.ranzcp.org/Files/Resources/College_Statements/Position_Statements/ps62-pdf.aspx

Expert Commentary

Australian College of Mental Health Nurses (ACMHN)

Introductory comments

The low number of HCOs participating (particularly in the area of care planning) makes interpretation very difficult. However, the large difference between the 20th and 80th centiles on some CIs suggests great diversity in the performance of community-based mental health services.

Community

A number of trends are observed in the data for registered consumers seen face-to-face by community service (**CI 1.1**) between 2007 and 2013. Firstly, the number of HCOs that are participating has reduced from a peak of 27 in 2008 to 16 in 2013. At the same time, the number of consumers registered with the service is greater in 2013 than in 2010 / 2011 when there were more HCOs participating. The reason for this is unclear. This creates difficulty in accurately interpreting the data, particularly as the desirable rate is

unspecified for the CI. This issue has been identified previously. It is pleasing to note that the rate of change has strengthened for the annual total rate to 85.0 per 100 consumers seen, with stability in the rate for the 80th centile evident.¹

Consumers / nominated carers – >24 treatment days over 3 month period (**CI 1.2**) has maintained sustained growth in recent years, although it is again noted that participation has declined from 22 in 2009 to 13 in 2012 and 2013. The variation in data over the reporting years is marked and it is difficult to interpret. It may represent greater reach and involvement by Mental Health Community Based services, which should arguably lead to better mental health outcomes. It may also reflect greater consumer need and demand, due to poorer mental health. Without mental health outcome measures to contrast the data with, it is not possible to make an accurate determination in either direction.

The rate of consumers / carers with at least 3 face-to-face contacts within 7 day period (**CI 1.3**) is widely variable over the reporting period. Notwithstanding this, the rate exhibited in 2013 is the largest in the 2007 – 2013 period at 33.8%. The rate of performance of the 20th centile has also increased considerably when compared with preceding years. It is possible that this change is indicative of the orientation of the reporting HCOs favouring a crisis model of care that would see an appropriate increase in frequency of contact over a short time period. However, if interpreted alongside the results of the preceding CI (**CI 1.2**), it may be that there is an increase in the acuity of mental health problems or greater challenges in optimising the stability of the mental state of people receiving care.



Between 2007 and 2010, there was a steady decline in **CI 1.4** overall, including for both 20th and 80th centile HCOs. Since 2011, these rates have steadily increased with HCOs in the 20th centile increasing at twice the rate recorded in 2007. The overall rate is the highest it has ever been over the reporting period. This may be indicative of greater resource demands and demand on admissions due to acuity of mental health problems. The reduction in contributing HCOs from 20 to 10 is of concern as it provides less reliability to the data and may alter the rates and their interpretation considerably.

Care planning

There is enormous volatility around **CI 2.1** data. Commentary is extremely difficult given the variability of the numerator and denominator of this CI. Whilst the number of reporting HCOs has been somewhat stable over the past three years (with 2010 markedly anomalous), the numerator and denominator figures are widely disparate. This could reflect fundamental underlying differences in the organisation or service patterns of

the HCOs that in turn could account for the volatility in the results. Other explanations for low performance relate to willingness or capacity for consumers to participate or obstacles to participation, such as ethnicity and language barriers. Such underlying differences may then translate to differing stages of evolution and development within each HCO in relation to this CI. However, it is acknowledged that an improvement in performance in the CI would be anticipated in contemporary mental health care in Australia with respect to consumer participation standards, which are recognised and supported by all governments under the National Mental Health Strategy.²

CI 2.2 has a very low rate of carers involved in developing care plans, with 2010 once again exceedingly anomalous, as in the previous CI. It is again acknowledged that an improvement in performance in the CI would be anticipated in contemporary mental health care in Australia with respect to carer participation standards, which are recognised and supported by all governments under the National Mental Health Strategy.²

General comments

- Allocating unique identifiers to participating HCOs would help to enable comparison across years and may help to stabilise the capacity to identify changes in the data.
- Indicating when participating HCOs are characteristically different geographically and demographically may assist future analysis.

References

1. Australasian Clinical Indicator Report 2004–2011: 13th edition. The Australian Council on Healthcare Standards, Sydney, Australia p. 72.
2. www.health.gov.au/internet/main/publishing.nsf/Content/mental-consume



Mental Health Inpatient

VERSION 6

Diagnosis and care planning

CI 1.1 Inpatients allocated a diagnosis within 24 hours of admission (H) In 2013, there were 38,421 inpatients reported from 68 HCOs. The annual rate was 95.0 per 100 inpatients. The fitted rate deteriorated from 94.0 to 93.3, a change of 0.75 per 100 inpatients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were 22 outlier records from 16 HCOs whose combined excess was 817 fewer inpatients allocated a diagnosis within 24 hours of admission. The outlier HCO rate was 82.5 per 100 inpatients.

CI 1.2 Documented diagnosis upon discharge (H) In 2013, there were 41,796 inpatients reported from 65 HCOs. The annual rate was 94.0 per 100 inpatients. The fitted rate improved from 87.5 to 91.5, a change of 4.0 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 4.0 per 100 inpatients. In 2013, the potential gains totalled 2,406 more inpatients with a diagnosis on hospital discharge recorded in the medical record. There were 27 outlier records from 21 HCOs whose combined excess was 1,007 fewer inpatients with a diagnosis on hospital discharge recorded in the medical record. The outlier HCO rate was 83.3 per 100 inpatients.

CI 1.3 Inpatients with an individual care plan (H) In 2013, there were 31,306 inpatients reported from 54 HCOs. The annual rate was 87.6 per 100 inpatients. The fitted rate improved from 79.1 to 86.1, a change of 7.0 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 7.2 per 100 inpatients. In 2013, the potential gains totalled 3,777 more inpatients with an individual care plan, which was constructed and regularly reviewed with the inpatient. There were 22 outlier records from 14 HCOs whose combined excess was 1,565 fewer inpatients with an individual care plan, which was constructed and regularly reviewed with the consumer. The outlier HCO rate was 65.1 per 100 inpatients.

Physical examination of patients

CI 2.1 Physical examination documented within 48 hours of admission (H) In 2013, there were 35,653 inpatients reported from 70 HCOs. The annual rate was 87.5 per 100 inpatients. The fitted rate improved from 83.9 to 87.5, a change of 3.6 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was

3.9 per 100 inpatients. In 2013, the potential gains totalled 4,136 more inpatients with a complete documented physical examination within 48 hours of admission. There were 19 outlier records from 15 HCOs whose combined excess was 1,589 fewer inpatients with a complete documented physical examination within 48 hours of admission. The outlier HCO rate was 68.3 per 100 inpatients.

Prescribing patterns

CI 3.1 Inpatients on 3 or more psychotropic medications at the time of discharge (L) In 2013, there were 21,417 inpatients reported from 42 HCOs. The annual rate was 5.2 per 100 inpatients. The fitted rate improved from 11.3 to 3.9, a change of 7.4 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 7.5 per 100 inpatients. In 2013, the potential gains totalled 1,065 fewer inpatients on 3 or more psychotropic medications from 1 sub-group category on discharge, corresponding to a reduction by approximately four-fifths. There were ten outlier records from seven HCOs whose combined excess was 499 more inpatients on 3 or more psychotropic medications from 1 sub-group category on discharge. The outlier HCO rate was 20.2 per 100 inpatients.

Electroconvulsive therapy

CI 4.1 Acute inpatients undergoing non-maintenance ECT of more than 12 treatments (L) In 2013, there were 4,272 patients reported from 63 HCOs. The annual rate was 7.1 per 100 patients. The fitted rate improved from 11.3 to 7.9, a change of 3.3 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 3.2 per 100 patients. In 2013, the potential gains totalled 131 fewer patients undergoing more than 12 treatments of electroconvulsive therapy, corresponding to a reduction by approximately one-third. There were eight outlier records from five HCOs whose combined excess was 72 more patients undergoing more than 12 treatments of electroconvulsive therapy. The outlier HCO rate was 28.8 per 100 patients.

CI 4.2 Major medical complications while undergoing ECT (L) In 2013, there were 3,812 patients reported from 57 HCOs. The annual rate was 0.50 per 100 patients. The fitted rate improved from 0.80 to 0.50, a change of 0.30 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.30 per 100 patients.



In 2013, the potential gains totalled seven fewer patients experiencing major medical complications while undergoing electroconvulsive therapy, corresponding to a reduction by approximately one-third. There was one outlier record from one HCO whose combined excess was one more patient experiencing major medical complications while undergoing electroconvulsive therapy. The outlier HCO rate was 11.5 per 100 patients.

Use of seclusion and restraint

CI 5.1 Inpatients having at least 1 episode of seclusion in an admission (L) In 2013, there were 33,211 inpatients reported from 41 HCOs. The annual rate was 5.7 per 100 inpatients. The fitted rate improved from 10.1 to 6.6, a change of 3.5 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 3.6 per 100 inpatients. In 2013, the potential gains totalled 1,282 fewer inpatients having at least 1 episode of seclusion, corresponding to a reduction by approximately two-thirds. There were 13 outlier records from ten HCOs whose combined excess was 380 more inpatients having at least 1 episode of seclusion. The outlier HCO rate was 15.0 per 100 inpatients.

CI 5.2 Seclusion – 2 or more episodes of seclusion (L) In 2013, there were 1,639 inpatients reported from 33 HCOs. The annual rate was 30.8 per 100 inpatients. The fitted rate improved from 41.3 to 31.3, a change of 10.0 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 10.0 per 100 inpatients. In 2013, the potential gains totalled 26 fewer inpatients having at least 2 episodes of seclusion, corresponding to a reduction by approximately one-fifteenth.

CI 5.3 Seclusion – more than 4 hours in 1 episode (L) In 2013, there were 1,853 inpatients reported from 35 HCOs. The annual rate was 49.5 per 100 inpatients. The fitted rate deteriorated from 39.5 to 53.7, a change of 14.2 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 16.0 per 100 inpatients. In 2013, the potential gains totalled 572 fewer inpatients having seclusion for more than 4 hours, corresponding to a reduction by approximately one-half. There were four outlier records from two HCOs whose combined excess was 159 more inpatients having seclusion for more than 4 hours. The outlier HCO rate was 79.0 per 100 inpatients.

CI 5.4 Seclusion – not reviewed by sight at least half-hourly (L) In 2013, there were 1,280 inpatients reported from 29 HCOs. The annual rate was 0.39 per 100 inpatients. The fitted rate improved from 0.74 to 0.31, a change of 0.43 per 100 inpatients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There was one outlier record from one HCO whose combined excess was two more inpatients in seclusion not reviewed by sight at least half-hourly. The outlier HCO rate was 18.8 per 100 inpatients.

CI 5.5 Inpatients experiencing major complications while in seclusion (L) In 2013, there were 1,412 inpatients reported from 28 HCOs. The annual rate was 0.071 per 100 inpatients. There was no significant trend in the fitted rate. There were no potential gains in 2013.

CI 5.6 Mean number of episodes of seclusion per secluded inpatient (L) In 2013, there were 1,707 secluded patient reported from 28 HCOs. The average number of seclusions in per secluded patient was 1.8.

CI 5.7 Inpatients having at least 1 episode of physical restraint (L) In 2013, there were 22,634 inpatients reported from 31 HCOs. The annual rate was 2.2 per 100 inpatients. The fitted rate improved from 2.3 to 1.4, a change of 0.87 per 100 inpatients. The potential gains totalled 487 fewer inpatients having at least 1 episode of physical restraint, corresponding to a reduction by approximately four-fifths. There were four outlier records from three HCOs whose combined excess was 221 more inpatients having at least 1 episode of physical restraint. The outlier HCO rate was 6.2 per 100 inpatients.

CI 5.8 Physical restraint – major complications (L) In 2013, there were 439 patients reported from 11 HCOs. The annual rate was 0.68 per 100 patients. The fitted rate deteriorated from 0.31 to 1.6, a change of 1.3 per 100 patients. There were no potential gains in 2013.

Major critical incidents

CI 6.1 Inpatients with an attempted or actual suicide in an admission (L) In 2013, there were 51,200 inpatients reported from 81 HCOs. The annual rate was 0.32 per 100 inpatients. The fitted rate improved from 0.57 to 0.32, a change of 0.25 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.25 per 100 inpatients. In 2013, the potential gains totalled 71 fewer inpatients with an attempted or actual suicide, corresponding to a reduction by approximately one-third. There were five outlier records from five HCOs whose combined excess was 20 more inpatients with an attempted or actual suicide. The outlier HCO rate was 1.9 per 100 inpatients.



CI 6.2 Inpatients who assault in an admission (L)

In 2013, there were 46,073 inpatients reported from 71 HCOs. The annual rate was 1.8 per 100 inpatients. The fitted rate improved from 2.7 to 1.5, a change of 1.2 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.2 per 100 inpatients. In 2013, the potential gains totalled 788 fewer inpatients who assaulted, corresponding to a reduction by approximately four-fifths. There were 25 outlier records from 17 HCOs whose combined excess was 441 more inpatients who assaulted. The outlier HCO rate was 6.6 per 100 inpatients.

CI 6.3 Inpatients who assault twice or more in an admission (L)

In 2013, there were 687 inpatients reported from 32 HCOs. The annual rate was 25.6 per 100 inpatients. The fitted rate deteriorated from 20.7 to 28.2, a change of 7.5 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 7.8 per 100 inpatients. In 2013, the potential gains totalled 16 fewer inpatients who assaulted twice or more, corresponding to a reduction by approximately one-fifteenth.

CI 6.4 Inpatients who undertake significant self-mutilation in an admission (L)

In 2013, there were 47,928 inpatients reported from 77 HCOs. The annual rate was 0.48 per 100 inpatients. The fitted rate improved from 0.56 to 0.40, a change of 0.16 per 100 inpatients. The potential gains totalled 175 fewer inpatients who undertook significant self-mutilation, corresponding to a reduction by approximately three-quarters. There were ten outlier records from nine HCOs whose combined excess was 70 more inpatients who undertook significant self-mutilation. The outlier HCO rate was 2.8 per 100 inpatients.

CI 6.5 Inpatients suffering significant other injuries in an admission (L)

In 2013, there were 38,199 inpatients reported from 59 HCOs. The annual rate was 0.20 per 100 inpatients. The fitted rate improved from 0.49 to 0.19, a change of 0.30 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.30 per 100 inpatients. In 2013, the potential gains totalled 64 fewer inpatients suffering significant other injuries, corresponding to a reduction by approximately four-fifths. There were seven outlier records from six HCOs whose combined excess was 33 more inpatients suffering significant other injuries. The outlier HCO rate was 2.0 per 100 inpatients.

CI 6.6 Inpatients assaulted by staff / visitors / other inpatients (L)

In 2013, there were 34,811 inpatients reported from 50 HCOs. The annual rate was 0.79 per 100 inpatients. The fitted rate improved from 1.2 to 0.69, a change of 0.49 per 100 inpatients. The potential gains totalled 262 fewer inpatients assaulted, corresponding to a reduction by approximately four-fifths. There were 15 outlier records from ten HCOs whose combined excess was 157 more inpatients assaulted. The outlier HCO rate was 3.3 per 100 inpatients.

Readmissions to hospital

CI 7.1 Unplanned readmissions within 28 days (L)

In 2013, there were 55,382 separations reported from 83 HCOs. The annual rate was 6.0 per 100 separations. The fitted rate improved from 8.6 to 5.8, a change of 2.7 per 100 separations. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.7 per 100 separations. In 2013, the potential gains totalled 2,288 fewer unplanned readmissions within 28 days, corresponding to a reduction by approximately two-thirds. There were 17 outlier records from 12 HCOs whose combined excess was 860 more unplanned readmissions within 28 days. The outlier HCO rate was 15.1 per 100 separations.

Mortality

CI 8.1 Inpatient deaths (L) In 2013, there were 55,792 inpatients reported from 78 HCOs. The annual rate was 0.082 per 100 inpatients. The fitted rate improved from 0.093 to 0.064, a change of 0.029 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.029 per 100 inpatients. In 2013, the potential gains totalled 30 fewer inpatient deaths, corresponding to a reduction by approximately one-half. There were two outlier records from two HCOs whose combined excess was 15 more inpatient deaths. The outlier HCO rate was 0.96 per 100 inpatients.

Continuity of care

CI 9.1 Discharge summary / letter upon discharge (H)

In 2013, there were 41,040 inpatients reported from 68 HCOs. The annual rate was 77.6 per 100 inpatients. The fitted rate deteriorated from 74.6 to 73.6, a change of 1.1 per 100 inpatients. The potential gains totalled 7,956 more inpatients who had a discharge summary or letter at discharge. There were 33 outlier records from 23 HCOs whose combined excess was 3,682 fewer inpatients who had a discharge summary or letter at discharge. The outlier HCO rate was 35.0 per 100 inpatients.



CI 9.2 Final discharge summary recorded within 2 weeks of discharge (H)

In 2013, there were 33,531 inpatients reported from 59 HCOs. The annual rate was 76.6 per 100 inpatients. The fitted rate deteriorated from 79.0 to 75.8, a change of 3.1 per 100 inpatients. The potential gains totalled 6,510 more inpatients who had a final discharge summary recorded within 2 weeks of discharge. There were 29 outlier records from 19 HCOs whose combined excess was 2,748 fewer inpatients who had a final discharge summary recorded within 2 weeks of discharge. The outlier HCO rate was 45.7 per 100 inpatients.

Long-term care

CI 10.1 Inpatients with a multidisciplinary review (H)

In 2013, there were 184 inpatients reported from 18 HCOs. The annual rate was 91.8 per 100 inpatients. The fitted rate improved from 76.9 to 96.5, a change of 19.6 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 21.9 per 100 inpatients. In 2013, the potential gains totalled 12 more inpatients who had a multidisciplinary review recorded every 3 months. There was one outlier record from one HCO whose combined excess was five fewer inpatients who had a multidisciplinary review recorded every 3 months. The outlier HCO rate was 22.2 per 100 inpatients.

Length of stay

CI 11.1 Inpatient length of stay (L) In 2013, there were 48,590 inpatient episodes reported from 69 HCOs. The annual rate was 14.4 per 100 inpatient episodes. The fitted rate improved from 18.6 to 14.7, a change of 3.8 per 100 inpatient episodes. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 3.7 per 100 inpatient episodes. In 2013, the potential gains totalled 3,203 fewer inpatients in an acute unit with a length of stay greater than 30 days, corresponding to a reduction by approximately one-third. There were 34 outlier records from 23 HCOs whose combined excess was 1,162 more inpatients in an acute unit with a length of stay greater than 30 days. The outlier HCO rate was 24.0 per 100 inpatient episodes.

Admission

CI 12.1 Admission type (N) In 2013, there were 24,575 admissions reported from 35 HCOs. The annual rate was 67.3 per 100 admissions. The fitted rate increased from 49.1 to 64.3, a change of 15.1 per 100 admissions. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 10.8 per 100 admissions.

Expert Commentary

Royal Australian and New Zealand College of Psychiatrists (RANZCP)

Opening comments

It is encouraging to see continuing improvement in a number of CIs relating to inpatient mental care, including the use of restrictive interventions such as seclusion, and the frequency of critical incidents.

Diagnosis and care planning

Diagnosis allocated within 24 hours of admission (**CI 1.1**), an important index of patient care, has remained fairly constant (92.4 – 95.4%) over the period of study. There was little variation between HCOs in 2013.

It is pleasing to see that the documentation of diagnosis upon discharge (**CI 1.2**) rate increased (to 94%) in 2013 and that there has been an upward trend during the study period.

There have been modest gains in the rate that the individual care plan – regularly reviewed with consumers (**CI 1.3**) is completed. There remains, however, scope for further improvement in this important index of recovery oriented practice.



Physical examination of patients

The rate for physical examination documented within 48 hours of admission (**CI 2.1**) has remained fairly constant during the period of study. Whilst patients who refuse to be examined, or are too behaviourally disturbed to cooperate, limit the scope for improvement, significantly higher rates in some jurisdictions (95.3 in NSW in 2013) suggest that further improvement is possible.

Prescribing patterns

The continued improvement in **CI 3.1** is to be welcomed. However, the lower stratum rate in some jurisdictions (1.42 in NSW vs. national rate of 5.21 in 2013) suggests that further improvement can be achieved.

Electroconvulsive therapy

The improvement in the rate as well as the number of acute inpatients undergoing treatments of ECT (**CI 4.1**) over the study period is welcome. Notably the denominator, the total number of inpatients undergoing a course of non-maintenance ECT, also decreased. In some jurisdictions the rate is higher than elsewhere, for instance in NSW the rate in 2013 was 11.9 compared to the National Rate of 7.09.

The trend towards diminishing number of patients experiencing a major medical complication while undergoing ECT (**CI 4.2**) is welcome (5 patients per 1,000 undergoing non-maintenance ECT in 2013), and reinforces the reputation of ECT as a safe therapeutic intervention.

Use of seclusion and restraint

Pleasingly the number of patients who are secluded (**CI 5.1**) continues to decline. This finding no doubt reflects in part the national and international attention that has been accorded to the use of seclusion.¹ Similarly the number of patients who are secluded 2 or more times (**CI 5.2**) has also fallen. Whilst the rate of patients who are **CI 5.3** has increased somewhat, the actual number of patients in this category has declined. Two large HCOs account for a significantly excessive number of events.

Pleasingly the rates for the other seclusion measures (**CI 5.4** and **CI 5.5**) have fallen significantly to become events that are now scarce.

While the number of physical restraints in **CI 5.7** is heading in a downward direction, the number of patients who were restrained in 2013 rose sharply. Unsurprisingly, restraint is largely a public sector phenomenon. Very few patients in private HCOs were required to be restrained. There is however, significant inter-state variation, for instance the rate in NSW in 2013 was more than 10 times the rate in Victoria. Also of note, 3 large HCOs accounted for a significant number of excess events.

Major critical incidents

Eighty-one HCOs reported on attempted or actual suicide (**CI 6.1**). The trend for this important CI is encouraging with a significant improvement over the last 8 years and a rate of 0.32 in 2013. For the most part, the variation between HCOs is small.

The number of inpatients who assault during admission (**CI 6.2**) has improved over the past 8 years. As would be expected, this is a relatively uncommon event in private HCOs. There is significant variation between HCOs, with 17 of the 71 HCOs that contributed data ranked as outliers.

While the number of inpatients who assault twice or more (**CI 6.3**) has declined over the study period, so too has the denominator (the number of patients who assault at all), accounting for the increased rate observed.

There has been a modest but significant improvement in the rate of significant self-mutilation in an admission (**CI 6.4**), with a rate of 0.48 in 2013.

Similarly, the rate of injury, not self-inflicted (**CI 6.5**), continues to improve with a total of 78 inpatients from 59 HCOs suffering significant other injuries in 2013.

However, while the overall rate for inpatients assaulted (**CI 6.6**) shows improvement, there is significant variation between HCOs. Not surprisingly, this is an uncommon event in private HCOs. There is nevertheless considerable variation between public HCOs with ten HCOs contributing outlying data, suggesting that further improvement is possible.

Readmissions to hospital

While the trend for the rate of unplanned admissions within 28 days (**CI 7.1**) shows improvement, the rate of readmission in 2013 rose. Again unsurprisingly, readmission is a more common event in the public sector. Twelve of the HCOs fell into the outliers group. It is possible that different models of care may account for some of the variation observed, for instance services for youth populations commonly anticipate a higher rate of readmission.



Mortality

While the number of inpatient deaths (**CI 8.1**) rose in 2013, this CI has trended downward over the past 8 years. Of note, there are no significant stratum differences and little variation between HCOs, with just two of 78 HCOs contributing outlying data.

Continuity of care

There remains scope for improvement in the rate that a discharge summary / letter is completed upon discharge (**CI 9.1**) with little change over the past 8 years. Of note, the public system does not perform as well on this CI as the private sector and there is considerable variation between states with NSW a high achiever and WA falling behind the mean.

There is also room for improvement in **CI 9.2**, with the summary completed in just over three in four patients in 2013 and the rate trending marginally downward over the last 8 years. Again this is a key task which is seen as vital to ensuring that good quality care is delivered in the crucial post-admission period.

Long-term care

The number of inpatients whose hospital stay exceeds 3 months is now an uncommon event. Unfortunately, the number of HCOs contributing data about this CI has also declined; 18 provided data in 2013. From these limited data it appears that the rate of three-monthly multidisciplinary review (**CI 10.1**) is trending in an upward direction.

Length of stay

The proportion of inpatient admissions exceeding 30 days (**CI 11.1**) continues to decline; in 2013 the rate was 14.4, based on data from 69 HCOs. This finding no doubt reflects a range of factors such as continuing high demand for scarce inpatient beds, increasing pressure on mental health units to meet ED discharge targets as well as an increasing supply of community-based alternatives to inpatient care such as Prevention and Recovery Care Services (PARCS). Of note, the rate for private HCOs exceeds that experienced in public HCOs (17.1 versus 11.3 in 2013). This may reflect the different funding arrangements for private HCOs as well as the very high demand for public HCO beds.

Admission

The proportion of admissions that occur on a voluntary basis (**CI 12.1**) continues to increase; two in three were voluntary in 2013. However, the number of HCOs providing data has declined (35 did so in 2013) making meaningful interpretation of the data difficult without further information.

General comments

At this point, despite the increased attention that has been given to recovery oriented practice in recent years², changes in practice are yet to be reflected in the data.

References

1. RANZCP Position Statement: Minimising the use of seclusion and restraint in people with mental illness, RANZCP, June 2010, see: https://www.ranzcp.org/Files/Resources/College_Statements/Position_Statements/ps61-pdf.aspx
2. Australian Health Ministers' Advisory Council: A National Framework for Recovery-oriented Mental Health Services: Policy and Theory. Commonwealth of Australia, 2013



Expert Commentary

Australian College of Mental Health Nurses (ACMHN)

Diagnosis and care planning

The increase in the rate of consumers with a documented diagnosis upon discharge (**CI 1.2**) may reflect the introduction from July 2013 of Activity Based Funding using Australian Refined Diagnosis Related Groups (AR-DRGs) as the classification system for inpatient mental health services.

In regard to **CI 1.3**, the review of care plans with consumers should be a fundamental aspect of mental health care in inpatient units. The improvement in this CI has continued in 2013.

Physical examination of patients

There is a slight decrease in compliance for **CI 2.1** from 2012 to 2013, although figures recorded since 2006 show little improvement overall. The strata rate for NSW is noted to be significantly higher for 2013. This may be attributed to the identification of a cluster of serious clozapine-related physical health problems and a new policy directive which impresses robust and thorough physical examination of mental health patients.

Factors contributing to lower compliance may be related to patient acuity, service procedures and resources (e.g. medical officer availability). The outlier rate is much lower and it is important to note what barriers exist with these HCOs. Consideration is often given to EDs as a portal for inpatient mental health admission to meet this CI, although there are significant limitations on ED ability to conduct comprehensive physical assessment.

Nurses have a role in ensuring timely physical assessments and ongoing follow-up where the requirement cannot be met initially. NSW policy maintains that physical examination should be conducted by appropriately trained staff including nurses¹ and this may assist improved compliance where medical officer resources are limited.

Prescribing patterns

There is a continued decline in rates of inpatients discharged on three or more psychotropic medications (**CI 3.1**). At first glance, NSW is the leading performer in 2013, although it might be more important to ask why the other groups are prescribing three or more medications from the one drug class at much higher rates. Treatment regimes that are concise and limit poly-pharmacy are considered good clinical practice with benefits to patients and services in minimising costs of regimes, side-effect burden and therefore costs to services. Factors like poor adherence to treatment and substance use habits may be contributing to decreased medication efficiency and a perception of the need for a more complex regime, although it could be argued that this could also increase the risk of treatment non-compliance. Complex cases where diagnostic uncertainty or complex symptomatology is noted may be negatively impacting on the data.

Substance habits may be the reason behind such prescribing patterns in the hypnotics and anxiolytic groups. It would be of interest to note from these data the most common subgroups that are prescribed in this manner. Medication reconciliation is an important aspect of safe care. Vigilance with this at admission, ongoing inpatient handover / exit planning and transfer of care may also minimise the risk that poly-pharmacy will occur.

Electroconvulsive therapy

With regard to acute inpatients receiving more than 12 ECT treatments during an acute course (**CI 4.1**), NSW continues to rate twice as high with this CI than other states with WA showing similar figures. This continues from 2012 despite an overall decrease in rates. Previous commentary by the RANZCP purports this due to increased use of ultra-brief ECT, which may require more than the usual 8–12 treatments per course.

Furthermore, the number of treatments per course is linked to the responsiveness to each treatment and this in turn can be affected by the nature of the disorder being treated. It would be worthwhile investigating these data further to ascertain which diagnostic groups are included in the data and the mechanism of treatment.

While there is a steady decline in the number of inpatients experiencing a major medical complication while undergoing an acute course of ECT (**CI 4.2**) since data collection began, there are some distinct fluctuations in rates. For 2013, the rate is less than for 2012, which is pleasing.

This may be a result of increased compliance with state-based standards of practice and guidelines for ECT administration. Part of such guidelines is a recommendation for pre-ECT work-ups including thorough physical examinations and assessment including anaesthetic consultation.

Overall the rates remain low when considering other CIs of general hospital care, for example rates of unplanned transfer or overnight admission following a day surgery procedure.



Use of seclusion and restraint

CI 5.1 aims to report on the frequency of seclusion use in a health service. Frequency of seclusion use is influenced by many variables. Perhaps what might be more useful is the percentage of patients admitted who have an episode of seclusion, or episodes per 1000 bed days, which is reported at a state-wide level in many jurisdictions.

These alternative CIs might say more about seclusion practices within a health service generally. The CI as it stands has limitations for the purpose of benchmarking as it doesn't factor in service type variables such as service size / bed capacity / numbers of locked beds compared to open ward beds. The larger the service, the more likely it is that seclusion events will occur. Public and private HCOs have obvious differences that impact on seclusion rates – the patient population is largely voluntary in private care, whereas in public HCOs, there are larger numbers of involuntary patients with more acute behavioural disturbance. It is good to see a rate per 100 patients included in the report and a reduction over time. These reductions are consistent with our knowledge and observations of mental health service commitment to seclusion reduction across the health services.

It is pleasing to see a reduction in **CI 5.2** for the report, but also noted is a reduction in HCOs submitting. A hypothesis for follow-up seclusion rates being higher in some jurisdictions might be, in the context of seclusion rates dropping overall across all jurisdictions, that those patients being secluded are more acute and have higher levels of disturbance. This population usually requires more intensive treatment and longer recovery times. With services keen to reduce both rates and the time spent in seclusion, often patients might be de-secluded too

early and have subsequent episodes, or be secluded on admission then have one further episode; so fewer people overall require seclusion, but those who do are more disturbed and require more containment. With falls in length of stay and more community-based care options, those being treated in hospital are more unwell than in the past.

CI 5.3 remains a useful CI for health services. Increased time spent in seclusion has risen significantly over the past eight years. In a context of reducing seclusion across HCOs, one possibility is that patients being secluded are perhaps more acutely disturbed and need ongoing containment. A particular cohort of patients with acute drug intoxication and associated psychosis is an example of a group that may require longer containment and recovery times. This group often contains first episode patients who are naïve to psychiatric treatments and consequently receive lower doses and conservative management. A second factor is the impact of patients being managed in seclusion overnight. Staff are reluctant to de-seclude overnight due to reduced staffing levels (medical and nursing), thus potentially extending seclusion hours until more staff are on duty.

There is also a reluctance to wake a sleeping patient to de-seclude as this might increase risk in a context of reduced staff. Further analysis might be needed to understand whether extended stays in seclusion are during overnight periods. Chief Psychiatrist Guidelines for seclusion in Victoria provide flexibility for managing patients who are asleep in seclusion – it is preferable to de-seclude a sleeping patient, but not unless it is safe to do so.

CI 5.4 may have limited utility in some jurisdictions given differences in minimum observation requirements for secluded patients. The time interval of 30 minutes sits outside legislative expectations for patient observation in seclusion in several jurisdictions. For example, the Victorian mental health legislation requires patients in seclusion to be observed every 15 minutes. Perhaps the numerator should be changed from 30 minutes to at least every 15 minutes. Further, the CI does not reflect the reality that nurses document and are responsible for the visual observations in seclusion in most jurisdictions. Medical staff typically do not complete, or participate in, routine visual observations of patients in seclusion. Medical staff would be responsible for the medical staff review every four hours. This might be the reason for the decline in reporting the CI as it has limited usefulness to HCOs.

CI 5.5 remains strategically useful in the context of the key issue it seeks to address – harm to patients. There is no alternative CI that would have the same ease of collection and usefulness to services as this CI. It is pleasing to see there has been no increase in the rate over time. Monitoring patients in seclusion has been a particular focus in some jurisdictions who have implemented a 1 hour medical review post-commencement of seclusion. This practice is supported and might help identify early any potential complications arising from treatment or behavioural disturbance.

Total seclusion episodes (**CI 5.6**) may not be useful for the purpose of benchmarking as it lacks sensitivity to unit size and other variables. If the numerator was per 1,000 bed days, it might be more useful for benchmarking across jurisdictions. However, for the purpose of providing raw numbers / frequency, this serves a purpose.



It is pleasing to see a reduction in **CI 5.7** rates for the recent reporting period. This remains an important CI, particularly in some jurisdictions where physical restraint, as being different from mechanical restraint, will have greater oversight and reporting with changes to mental health legislation. In Victoria, a new Mental Health Act will come into effect 1 July 2014. This will require reporting of all restraint including both physical and mechanical. It remains a restrictive and undesirable safety intervention that is important to monitor in the context of reducing restrictive interventions generally. Some jurisdictions might reduce seclusion but see an increase in physical restraint. From this perspective, it is an important supplementary CI.

There has been a consistent focus on reducing seclusion and restraint under the National Mental Health Safety Priorities developed in 2005 – reduction of seclusion and restraint. The legislation in each jurisdiction also regulates the use of physical restraint devices and this is likely to be a factor contributing to the different rates across jurisdictions. The use of mechanical restraint in mental health services appears to be declining and is far less frequent than seclusion.

CI 5.8 remains an important CI and the trend towards less mechanical restraint is pleasing in the context of reducing other restrictive interventions. What would be interesting and a supplement to this CI might be harm caused by physical restraint. Often seclusion involves physically restraining a person and this can cause harm to staff and patients. This is more likely to occur than harm in mechanical restraint and would be more relevant to HCOs.

Major critical incidents

The continued decline in rates of attempted or actual inpatient suicide (**CI 6.1**) is very positive. The fitted rate decline is affected by the significant drop in rates per 100 patients in 2011 as a result of the increased number of admissions in HCOs reporting the CI. The recently reported rates could be returning to a base level similarly seen 2006 – 2010. The 2013 rates for the outlier HCOs are almost six times greater and investigation into the HCO characteristics may give further insights into such activity.

Ongoing risk assessment of the patient and the HCO environment together with staff training continues to be paramount to identifying risks and managing what is known. Collaborating with consumers in all these activities will ensure a universal approach taken by HCOs to minimise risks.

While the number of HCOs reporting **CI 6.2** has dropped by about 15%, the numerator numbers were only about 5% less than the previous year and therefore a slight increase in rate can be seen. There is also a notable difference in data between public and private facilities reflecting variations in admission criteria between these two strata. Patients with significant risk of behavioural disturbance are likely to be treated involuntarily in public HCOs. Private HCOs' pre-screening processes include histories of violence and forensic background and patients with such a history are considered a very high risk and may be refused admission.

Partnering with consumers in care planning, trauma-informed care and alternative interventions like sensory modulation equipment are important factors in minimising distress in patients at risk.

Nearly one-quarter of the HCOs reporting this CI display a significant level of assault by inpatients.

Of those patients who assaulted once during an admission, more than one-quarter of this reported group assaulted on at least one more occasion. The number of reporting HCOs for **CI 6.3** is quite low and there are no outliers identified for 2013. It could be suggested that the significant outliers for single assault could also have significant numbers of re-assaults.

Some studies have shown that while services are dedicated to minimising harm from restraint by regulating its use, rates of assaults by inpatients during an admission are increasing. One suggestion for this is the perception of clinical staff feeling pressure to not use restraint to manage imminent risk and intervening later in the trajectory of escalating behaviour.²

Significant self-mutilation (**CI 6.4**) rates continue to decline, which is positive. As services take up recovery-oriented and trauma-informed principals of practice, this should have an impact on the level of distress patients experience and improvements in coping, and therefore on the rates of self-harming behaviours.

It may be useful to consider the characteristics of these HCOs alongside that of those outliers with significantly higher rates of **CI 6.1** for further understandings.

For 2013, with regard to **CI 6.5**, there would be 64 fewer inpatients being injured if all HCOs were performing at the rate of the top 20%. This is a significant change from the previous year being almost double the gains that could be achieved. The outlier rate is ten times greater and both results indicate that there is still work to be done regarding patient safety from injury by other mechanisms.



It is not clear if the data contain information about inpatients that were injured while on leave during an episode of admission and as such, possible contributing factors are less likely to be related to mental health HCO environments.

The rates for **CI 6.6**, number of inpatients assaulted by others, remains rather static over the last four years showing little improvement. Factors which remain relevant to this measure include acuity of patient groups and HCO-specific characteristics like size and resources available.

Assaults (as with seclusion and restraint events) are considered serious adverse events with potential for serious consequences, and as such, HCOs should be encouraged to treat each event at the very least with a clinical review, which aims at identifying contributing factors and to take action aimed at minimising the risk of such events in the future.

Of notable concern is the inclusion of 'assaults on inpatients by staff' into this CI. A brief search of literature on this issue pleasingly returned no specific results, indicating that they are rare occurrences in recent times.

Mortality

It is pleasing to see the number of participating HCOs in **CI 8.1** has increased slightly. The gains in 2013 totalled 30 fewer inpatient deaths, corresponding to a reduction by approximately one-half. Monitoring patient deaths enhances service providers' awareness of duty of care and promotes preventive measures in this critical area.

Long-term care

There was a reduction in the number of HCOs reporting on **CI 10.1**. This may reflect an ongoing trend for shorter inpatient stays and increased access for earlier, acute interventions.

Length of stay

It is pleasing that the proportion of consumers with a length of stay in an inpatient unit (**CI 11.1**) continues to decrease. This reflects the increased mental health policy focus on providing great support and services in the community through community mental health, non-government organisations and primary care providers including GPs. It is to be hoped that the greater focus on community-based mental health care will be reflected in increased participation in the Mental Health Community Based CIs in the future.

Admission

As noted in the RANZCP commentary in 2012, it would be more useful for **CI 12.1** to be reported separately for public and private hospitals. It is unclear whether there is any increase in the number of voluntary admissions in public hospitals. In general, the ACMHN considers that it would be more desirable for consumers to access inpatient mental health care as a voluntary patient.

References

1. NSW Department of Health (2009), Physical Health Care of Mental Health Consumers: Guidelines – 2009_007. Sydney.
2. MOYLAN, L. B. and CULLINAN, M. (2011) Frequency of assault and severity of injury of psychiatric nurses in relation to the nurses' decision to restrain. Journal of Psychiatric & Mental Health Nursing, 18(6), 526–534





Obstetrics

VERSION 7.2

Outcome of selected primipara

CI 1.1 Selected primipara who have a spontaneous vaginal birth (H) In 2013, there were 43,904 primipara reported from 160 HCOs. The annual rate was 44.6 per 100 primipara. The fitted rate deteriorated from 46.1 to 44.1, a change of 2.0 per 100 primipara. The potential gains totalled 4,000 more selected primipara who had a spontaneous vaginal birth. There were 17 outlier records from 13 HCOs whose combined excess was 834 fewer selected primipara who had a spontaneous vaginal birth. The outlier HCO rate was 25.9 per 100 primipara.

CI 1.2 Selected primipara who undergo induction of labour (L) In 2013, there were 43,515 primipara reported from 160 HCOs. The annual rate was 31.6 per 100 primipara. The fitted rate deteriorated from 27.6 to 31.7, a change of 4.1 per 100 primipara. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 4.1 per 100 primipara. In 2013, the potential gains totalled 2,760 fewer selected primipara who underwent induction of labour, corresponding to a reduction by approximately one-fifth. There were 12 outlier records from nine HCOs whose combined excess was 515 more selected primipara who underwent induction of labour. The outlier HCO rate was 43.3 per 100 primipara.

CI 1.3 Selected primipara who undergo an instrumental vaginal birth (L) In 2013, there were 43,361 primipara reported from 157 HCOs. The annual rate was 25.3 per 100 primipara. The fitted rate deteriorated from 24.0 to 24.6, a change of 0.59 per 100 primipara. The potential gains totalled 1,841 fewer selected primipara who underwent an instrumental vaginal birth, corresponding to a reduction by approximately one-tenth. There were eight outlier records from six HCOs whose combined excess was 305 more selected primipara who underwent an instrumental vaginal birth. The outlier HCO rate was 40.6 per 100 primipara.

CI 1.4 Selected primipara undergoing caesarean section (L) In 2013, there were 43,433 primipara reported from 155 HCOs. The annual rate was 28.3 per 100 primipara. The fitted rate deteriorated from 28.1 to 28.7, a change of 0.61 per 100 primipara. The potential gains totalled 2,267 fewer selected primipara undergoing caesarean section, corresponding to a reduction by approximately one-tenth. There were 21 outlier records from 15 HCOs whose combined excess was 791 more selected primipara undergoing caesarean section. The outlier HCO rate was 44.6 per 100 primipara.

Vaginal birth after caesarean section (VBAC)

CI 2.1 Vaginal delivery following previous birth of caesarean section (N) In 2013, there were 17,773 deliveries reported from 120 HCOs. The annual rate was 13.1 per 100 deliveries. The fitted rate increased from 13.0 to 13.5, a change of 0.51 per 100 deliveries.

Major perineal tears and surgical repair of the perineum

CI 3.1 Selected primipara – intact perineum (H) In 2013, there were 29,002 primipara reported from 153 HCOs. The annual rate was 16.8 per 100 primipara. The potential gains totalled 2,892 more selected primipara with an intact perineum or unsutured perineal tear. There were 13 outlier records from 11 HCOs whose combined excess was 382 fewer selected primipara with an intact perineum or unsutured perineal tear. The outlier HCO rate was 6.4 per 100 primipara.

CI 3.2 Selected primipara – episiotomy and no perineal tear (L) In 2013, there were 27,148 primipara reported from 142 HCOs. The annual rate was 30.8 per 100 primipara. The fitted rate deteriorated from 27.7 to 30.6, a change of 2.8 per 100 primipara. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.8 per 100 primipara. In 2013, the potential gains totalled 2,584 fewer selected primipara undergoing episiotomy without perineal tear, corresponding to a reduction by approximately one-quarter. There were 20 outlier records from 14 HCOs whose combined excess was 791 more selected primipara undergoing episiotomy without perineal tear. The outlier HCO rate was 49.4 per 100 primipara.

CI 3.3 Selected primipara – perineal tear and NO episiotomy (L) In 2013, there were 26,959 primipara reported from 144 HCOs. The annual rate was 45.4 per 100 primipara. The fitted rate improved from 46.4 to 45.5, a change of 0.91 per 100 primipara. The potential gains totalled 1,751 fewer selected primipara sustaining a perineal tear without episiotomy, corresponding to a reduction by approximately one-tenth. There were nine outlier records from six HCOs whose combined excess was 345 more selected primipara sustaining a perineal tear without episiotomy. The outlier HCO rate was 59.6 per 100 primipara.



CI 3.4 Selected primipara – episiotomy and perineal tear (L)

In 2013, there were 26,098 primipara reported from 134 HCOs. The annual rate was 6.1 per 100 primipara. The fitted rate deteriorated from 5.6 to 6.1, a change of 0.49 per 100 primipara. The potential gains totalled 882 fewer selected primipara undergoing episiotomy and sustaining a tear, corresponding to a reduction by approximately one-half. There were 16 outlier records from 11 HCOs whose combined excess was 354 more selected primipara undergoing episiotomy and sustaining a tear. The outlier HCO rate was 14.1 per 100 primipara.

CI 3.5 Selected primipara – surgical repair of perineum for third degree tear (L)

In 2013, there were 30,026 primipara reported from 149 HCOs. The annual rate was 4.9 per 100 primipara. The fitted rate deteriorated from 4.1 to 5.0, a change of 0.94 per 100 primipara. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.94 per 100 primipara. In 2013, the potential gains totalled 553 fewer selected primipara undergoing surgical repair of the perineum for third degree tear, corresponding to a reduction by approximately one-third. There were ten outlier records from seven HCOs whose combined excess was 126 more selected primipara undergoing surgical repair of the perineum for third degree tear. The outlier HCO rate was 11.4 per 100 primipara.

CI 3.6 Selected primipara – surgical repair of perineum for fourth degree tear (L) In 2013, there were 30,958 primipara reported from 153 HCOs. The annual rate was 0.32 per 100 primipara. There was no significant trend in the fitted rate. The potential gains totalled 10 fewer selected primipara undergoing surgical repair of the perineum for fourth degree tear, corresponding to a reduction by approximately one-tenth.

General anaesthesia for caesarean section

CI 4.1 Women having a general anaesthetic for a caesarean section (L) In 2013, there were 54,635 caesareans reported from 145 HCOs. The annual rate was 6.4 per 100 caesareans. There was no significant trend in the fitted rate. The potential gains totalled 1,628 fewer women having a general anaesthetic for a caesarean section, corresponding to a reduction by approximately one-third. There were 27 outlier records from 19 HCOs whose combined excess was 483 more women having a general anaesthetic for a caesarean section. The outlier HCO rate was 11.8 per 100 caesareans.

Antibiotic prophylaxis and caesarean section

CI 5.1 Appropriate prophylactic antibiotic at time of caesarean section (H)

In 2013 there were 37,524 caesareans reported from 94 HCOs. The annual rate was 92.5 per 100 caesareans. The fitted rate improved from 69.9 to 94.5, a change of 24.6 per 100 caesareans. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 23.3 per 100 caesareans. In 2013, the potential gains totalled 2,315 more women who received an appropriate prophylactic antibiotic at the time of caesarean section. There were 23 outlier records from 20 HCOs whose combined excess was 1,185 fewer women who received an appropriate prophylactic antibiotic at the time of caesarean section. The outlier HCO rate was 75.8 per 100 caesareans.

Pharmacological thromboprophylaxis and caesarean section

CI 6.1 Unplanned LSCS – pharmacological thromboprophylaxis (H)

In 2013, there were 10,341 caesareans reported from 62 HCOs. The annual rate was 78.5 per 100 caesareans. The fitted rate improved from 53.5 to 80.4, a change of 26.9 per 100 caesareans. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 27.2 per 100 caesareans. In 2013, the potential gains totalled 2,048 more women receiving appropriate pharmacological thromboprophylaxis. There were 18 outlier records from 14 HCOs whose combined excess was 1,056 fewer women receiving appropriate pharmacological thromboprophylaxis. The outlier HCO rate was 32.8 per 100 caesareans.

CI 6.2 Planned LSCS – pharmacological thromboprophylaxis (H)

In 2013, there were 8,202 caesareans reported from 45 HCOs. The annual rate was 70.2 per 100 caesareans. The potential gains totalled 2,287 more women receiving appropriate pharmacological thromboprophylaxis. There were 13 outlier records from ten HCOs whose combined excess was 1,030 fewer women receiving appropriate pharmacological thromboprophylaxis. The outlier HCO rate was 25.0 per 100 caesareans.



Postpartum haemorrhage / blood transfusion

CI 7.1 Vaginal birth – blood transfusion (L) In 2013, there were 119,771 vaginal births reported from 155 HCOs. The annual rate was 1.3 per 100 vaginal births. The fitted rate deteriorated from 1.1 to 1.3, a change of 0.17 per 100 vaginal births. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.18 per 100 vaginal births. In 2013, the potential gains totalled 456 fewer women who gave birth vaginally who received a blood transfusion, corresponding to a reduction by approximately one-quarter. There were three outlier records from three HCOs whose combined excess was 47 more women who gave birth vaginally who received a blood transfusion. The outlier HCO rate was 2.5 per 100 vaginal births.

CI 7.2 Caesarean section – blood transfusion (L) In 2013, there were 61,991 caesareans reported from 147 HCOs. The annual rate was 1.4 per 100 caesareans. The fitted rate improved from 1.7 to 1.5, a change of 0.17 per 100 caesareans. The potential gains totalled 346 fewer women who underwent caesarean section who received a blood transfusion, corresponding to a reduction by approximately one-third. There were seven outlier records from six HCOs whose combined excess was 84 more women who underwent caesarean section who received a blood transfusion. The outlier HCO rate was 3.8 per 100 caesareans.

Intrauterine growth restriction (IUGR)

CI 8.1 Babies – birth weight <2750 g at 40 weeks gestation or beyond (L) In 2013, there were 60,451 deliveries reported from 128 HCOs. The annual rate was 1.6 per 100 deliveries. The fitted rate improved from 1.9 to 1.6, a change of 0.25 per 100 deliveries. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.24 per 100 deliveries. In 2013, the potential gains totalled 235 fewer babies born with birth weight less than 2750 g at 40 weeks gestation or beyond, corresponding to a reduction by approximately one-fifth. There were three outlier records from three HCOs whose combined excess was 37 more babies born with birth weight less than 2750 g at 40 weeks gestation or beyond. The outlier HCO rate was 11.2 per 100 deliveries.

Apgar score

CI 9.1 Term babies – Apgar score of <7 at 5 minutes post-delivery (L) In 2013, there were 165,861 babies reported from 163 HCOs. The annual rate was 1.3 per 100 babies. The fitted rate deteriorated from 1.0 to 1.3, a change of 0.29 per 100 babies. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.29 per 100 babies. In 2013, the potential gains totalled 712 fewer term babies born with an Apgar score of less than 7 at 5 minutes post-delivery, corresponding to a reduction by approximately one-quarter. There were seven outlier records from seven HCOs whose combined excess was 95 more term babies born with an Apgar score of less than 7 at 5 minutes post – delivery. The outlier HCO rate was 3.1 per 100 babies.

Admission of term babies to NICN or SCN

CI 10.1 Term babies – transferred / admitted to NICU / special care (L) In 2013, there were 159,506 babies reported from 152 HCOs. The annual rate was 10.4 per 100 babies. The fitted rate deteriorated from 9.3 to 10.4, a change of 1.1 per 100 babies. The potential gains totalled 11,559 fewer inborn term babies transferred / admitted to a neonatal intensive care nursery or special care nursery, corresponding to a reduction by approximately two-thirds. There were 54 outlier records from 34 HCOs whose combined excess was 3,533 more inborn term babies transferred / admitted to a neonatal intensive care nursery or special care nursery. The outlier HCO rate was 18.6 per 100 babies.

Peer review of serious adverse events

CI 11.1 Serious adverse events that are addressed within a peer review process (H) In 2013, there were 2,371 serious adverse events reported from 38 HCOs. The annual rate was 97.9 per 100 serious adverse events. The fitted rate improved from 46.3 to 97.8, a change of 51.5 per 100 serious adverse events. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 40.4 per 100 serious adverse events. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were four outlier records from three HCOs whose combined excess was 41 fewer serious adverse events that were peer reviewed. The outlier HCO rate was 33.3 per 100 serious adverse events.



Expert Commentary

Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG)

Outcome of selected primipara

There has been a small increase in the number of spontaneous vaginal births in the selected primipara (**CI 1.1**), but it remains at around 45.0%. There are several reasons why the number of spontaneous vaginal births will be expected to continue to lessen:

- Women becoming more risk averse and therefore more often requesting obstetric procedures in order to minimise risk. This applies to all women, but particularly in relation to common issues such as how long to tolerate pregnancy progressing beyond the due date
- Increasing maternal age
- Reducing maternal parity with the consequential reduced morbidity from caesarean section in subsequent pregnancies

Stratum differences were demonstrated in relation to private and public HCOs (36.4% vs. 50.8% respectively). This is expected as the above factors are more prevalent in the private sector than the public sector.¹

Rates for **CI 1.2** have continued to increase, reaching their highest rate of 31.6%. Rates are highest in WA, and in 2013, the lowest rates were in Victoria. Increasing induction of labour rates are very likely to continue as evidence accumulates that induction not only improves fetal outcomes in the presence of pregnancy complications, but in many situations will mostly not increase the rate of caesarean section and in numerous cases will reduce the likelihood of caesarean section.²

Rates for **CI 1.3** remain at circa 25% and show a slight upward trend. Rates are higher in WA relative to other states, and in private relative to public HCOs.³ The most likely explanation is the differences in the utilisation by women of regional analgesia for pain relief in labour – a factor which is known to change rates of instrumental birth.⁴

CI 1.4 remains remarkably constant at circa 28.5%. The numbers in the denominator are falling (even though the total birth rate is rising), suggesting fewer women are being classified as selected primipara. A rising of the caesarean section rate continues to be observed throughout developed countries for reasons specified already. These include a more risk-averse population of women who are older and less likely to have many future pregnancies (therefore less likely to have complications of a previous caesarean section in subsequent pregnancies). Trends in the private sector are even higher with the drivers being even more pronounced.

Vaginal birth after caesarean section (VBAC)

Vaginal delivery following a previous primary caesarean section (**CI 2.1**) remains at a fairly constant figure of circa 13%. This is parallel to the rate of similar developed countries. Falling rates of this CI might have been expected with the publication of data in 2012 showing better fetal outcomes and lower rates of severe maternal haemorrhage in women who plan an elective caesarean section rather than plan a vaginal birth after a primary caesarean section.⁵

Major perineal tears and surgical repair of the perineum

CI 3.1 is remarkably constant over time and across HCOs. This is reassuring given the differing practices in episiotomy thresholds – suggesting that obstetricians and midwives are not performing unnecessary episiotomies.

Despite data from **CI 3.1** remaining fairly constant at circa 30%, the optimal rate of episiotomy is unknown. Opinion is divided as to whether a mediolateral episiotomy affects the incidence of obstetric anal sphincter injuries (OASIS) and/or anorectal incontinence from neural injury. These injuries are some of the worst outcomes for women delivering vaginally. Rates are expected to be higher in the private sector where there are more instrumental births in association with greater utilisation of regional analgesia for pain relief in labour.

Rates for **CI 3.3** vary quite markedly across states, with the lowest rate in Victoria (40.6%) and highest in Queensland (51.2%). As expected, this is the exact opposite of the rates of episiotomy and no perineal tears, where Victoria is the highest (39.1%) and Queensland the lowest (24.0%).

The rate for **CI 3.4** remains around 6%. It is interesting to note that the state with the lowest episiotomy rate has the highest rate of both episiotomy and vaginal tear (9.1%). This may suggest that delayed use of an episiotomy increases the likelihood to end up with both episiotomy and tears.



The public HCO rate for **CI 3.5** is nearly twice that of the private HCOs (5.87 vs. 3.06). There may be several reasons for this. One reason could be the 'under-reporting' of third degree tears in private hospitals where borderline sphincter damage may be more often repaired in the birth suite rather than the operating theatre. If the more difficult instrumental births were less likely to be performed in the private sector, a reduction in major perineal tears would be expected.

The numbers for **CI 3.6** remain very low at circa 0.35% and are not increasing. The low numbers make comparison difficult, however the diagnosis is more objective than that of third degree tears.

General anaesthesia for caesarean section

The rates for **CI 4.1** have remained constant at 6.05 – 6.52%, however the private HCO rate is much lower than the public HCO rate (3.21 vs. 8.16 per 100 caesareans). Higher rates of general anaesthesia in public hospitals are likely to attribute to multiple factors including technical difficulties in morbidly obese patients and the ability to perform a 'code' GA caesarean section in a public hospital in the event of sudden severe fetal compromise in a situation not suitable for instrumental birth.

Antibiotic prophylaxis & caesarean section

The rate for **CI 5.1** has been improving significantly since 2008 to its current rate of 98.7%. Even the 20th centile is now 89.5% – a stark difference from the mean rate of 64.0% in 2008.

RANZCOG is pleased that this CI is rising. Reasons for this include:

- increased awareness amongst clinicians, as this topic is highlighted at meetings

- state network guidelines calling for this practice to be adopted
- better hospital audit systems to ensure compliance with best-practice guidelines.

Pharmacological thromboprophylaxis & caesarean section

The rate of 78.5% for **CI 6.1** is a little down from the previous value of 82.4%. It will be very interesting to see if this stabilises at around 80%. The rate should not be 100% in view of circumstances where the risk of life-threatening bleeding will exceed the risk of thromboembolism. Dramatically lower rates in NSW (25.6%) compared to other states (71.4% – 87.0%) reflect guideline differences. Lower rates in private HCOs may reflect a relative absence of clinical guidelines in that setting.

Regarding **CI 6.2**, a wide variation between those states reporting suggests guideline differences between Western Australia (36.7%) and Victoria (87.3%). The contemporary presence or absence of maternal deaths from thromboembolism would be expected to influence guideline development in individual states.

Postpartum haemorrhage / blood transfusion

Whilst **CI 7.1** rates have remained low since 2008 (1.11–1.25%), there are 525 centile gains and the private HCO rate is much lower than the public rate. Postpartum haemorrhage (PPH) rates seem to be rising worldwide, so it is pleasing to see that this CI is still low. The difference in private and public rates is likely to reflect such things as less physiological third-stage management which carries treble the rate of PPH. Different case-mix may also contribute.

The rate of blood transfusions at caesarean section (**CI 7.2**) is twice as high in public facilities as in private HCOs – again probably reflecting the different case-mix. The rates for South Australian HCOs (1.68%) remain higher than other states (1.04–1.44%). The difference in public versus private rates may be due to the experience of the surgeons performing the caesareans. Case-mix will be different, with the most 'at risk' women birthing through the public sector. Thresholds for transfusion may differ as well.⁶ Higher rates of blood transfusion in the public sector at caesarean section (1.85%) compared to the private sector (0.89%) are likely to reflect longer labours in the public sector as evidenced by the lower threshold for caesarean section in the private sector, alongside more complex caesarean sections being delivered in the public sector, e.g. placenta accreta.

Intrauterine growth restriction (IUGR)

The rate of **CI 8.1** has been steadily improving, but this appears to have plateaued at around 1.64%. Failure to diagnose intrauterine growth restriction remains the most obvious preventable factor in perinatal mortality at term. It has been rewarding to see this statistic fall over the 5 year period and it could be suggested that introducing this CI is partly responsible for this highly desirable improvement.

Apgar score

While year to year changes are small in **CI 9.1** rates, it is disturbing that the rate of low 5 minute Apgar scores is steadily trending up from 2008 (0.99) to 2013 (1.32). This may reflect a trend away from electronic fetal monitoring by some centres (the Intrapartum Fetal Surveillance Guideline allows both auscultation and electronic fetal monitoring as reasonable methods of



fetal surveillance in low risk labours). The markedly higher rates of low Apgar scores in public HCOs (1.58%) relative to private HCOs (0.84%) may reflect case-mix or other factors such as rates of continuous electronic fetal monitoring. It should be noted that Apgar scores are very subjective and open to bias. The College applauds those centres that have introduced routine cord biochemistry of all births in order to have objective measurement of fetal condition at all births.

Admission of term babies to NICN or SCN

Variation between HCOs in admissions to NICN / SCNs (**CI 10.1**) can be both negative and positive. Low admission rates might reflect better care (e.g. better management of gestational diabetes resulting in less neonatal hypoglycaemia) or alternatively, it may reflect less vigilance in the diagnosis and/or management of neonatal hypoglycaemia. It is disturbing to note that statistics around admissions of a term baby to NICN with grade 2 or 3 hypoxic ischaemic encephalopathy have not been collected. The Australian and New Zealand Neonatal Network (ANZNN) specifically does NOT collect this data – yet it is a strong predictor of cerebral palsy in term infants.

Peer review of serious adverse events

The rate of peer review of serious adverse events (**CI 11.1**) has increased to its highest level at 97.9%. Most hospitals now have well developed systems for critical (sentinel) event monitoring that goes hand in hand with an evaluation process. As institutions have jurisdictional reporting requirements, and hospitals have processes around these incidents, it is not surprising that this rate is high.

The rate is lower in non-metropolitan hospitals, but still reassuring at 75.2% – although low reporting rates may be associated with significant bias. The College has a programme for supporting rural centres in their peer-review processes in terms of external review of perinatal outcomes and also a programme of practice visits. The College is currently seeking ongoing funding for these processes.

General comments

Given that failure to diagnose IUGR remains the most preventable cause of stillbirth, the place of customised birth weight centiles needs to be explored. Recent data from Monash Health in Victoria showing that there are ethnic differences in stillbirth has further confused some clinicians. It is clear that customised birth weight centiles are a more accurate reflection of perinatal risk. However, to make this correction without considering the perinatal mortality attributable to ethnicity may actually increase the stillbirth risk.

Response rates

The numbers of participating HCOs are greater for those CIs that are more easily collected, are objective and have clinical meaning. Therefore, neonatal outcome measures (e.g. IUGR, low Apgars, admission to SCBU / NICU) not unexpectedly feature more prominently than thromboprophylaxis, which is more controversial and not routinely collected.

Quality Improvement

A low rate of third-degree tears should alert the HCO to the possibility of under-diagnosis of this condition and steps should be taken to ensure that all clinicians have undertaken training in the diagnosis and management of OASIS.

The rising rate of low Apgar scores should alert HCOs to be vigilant around fetal surveillance in labour and in particular to strict adherence to auscultation protocols if intermittent auscultation is to be used in place of continuous electronic fetal monitoring.

References

1. Cesarean delivery or vaginal birth: a survey of patient and clinician thresholds. Walker SP, McCarthy EA, Ugoni A, Lee A, Lim S, Permezel M. *Obstet Gynecol.* 2007 Jan;109(1):67-72.
2. *Obstet Gynecol.* 2013 Oct;122(4):761-9. doi: 10.1097/AOG.0b013e3182a6a4d0. Elective induction of labor at term compared with expectant management: maternal and neonatal outcomes. Darney BG1, Snowden JM, Cheng YW, Jacob L, Nicholson JM, Kaimal A, Dublin S, Getahun D, Caughey AB.
3. *Cochrane Database Syst Rev.* 2011 Dec 7;(12):CD000331. doi: 10.1002/14651858.CD000331.pub3. Epidural versus non-epidural or no analgesia in labour. Anim-Somuah M1, Smyth RM, Jones L.
4. *Women Birth.* 2013 Jun;26(2):e77-81. doi: 10.1016/j.wombi.2012.12.001. Epub 2012 Dec 29. Regardless of where they give birth, women living in non-metropolitan areas are less likely to have an epidural than their metropolitan counterparts.
5. *PLoS Med.* 2012;9(3):e1001192. doi: 10.1371/journal.pmed.1001192. Epub 2012 Mar 13. Planned vaginal birth or elective repeat caesarean: patient preference restricted cohort with nested randomised trial. Crowther CA1, Dodd JM, Hiller JE, Haslam RR, Robinson JS; Birth After Caesarean Study Group.
6. Begley CM, Gyte GM, Devane D, McGuire W, Weeks A. Active versus expectant management for women in the third stage of labour. *Cochrane Database Syst Rev.* 2011 Nov 9;(11):CD007412. doi: 10.1002/14651858.CD007412.pub3.



Expert Commentary

Australian College of Midwives (ACM)

Introductory comments

Last year at this review, the Australian College of Midwives requested that these set of CIs be renamed as Maternity CIs. It was agreed at the Working Party meeting that this would occur and so it is disappointing this hasn't happened and yet again this year we are reviewing the Obstetric CIs.

In general the Obstetric CIs, over the period reported, reflected increased intervention in labour and birth. Infant outcome CIs for Apgar score and admission to Special Care Nursery of term infants did not display improvement over the same period. Investigation is required as to why CI results for risk-adjusted groups of women are so frequently statistically different between public and private HCOs.

Outcome of selected primipara

It is beneficial to be able to see the gains of **CI 1.1** in 2013 against the private institutions. The mixing of both private and public hospitals in the previously reported year makes it difficult to do any real analysis of trend changes. For the state, it is therefore complex to work out exactly where or if any initiatives to change trends need to be directed. Although perhaps not possible for past data, it would be good if this CI could be separated into private and public and reported that way in the future.

The difference between private and public HCO results remain concerning. Investigation is required into determinants of primiparous women's choices for labour and birth intervention.

The increasing rate of induction in **CI 1.2** is concerning. Nothing has changed in the group as a selected population so it is difficult to understand why the rate is increasing and is likely to be due to practice.

As state strata results are statistically significant, differences may indicate effects of differences in policy implementation, data definition, recording and reporting. Widespread differences in policy for induction at 41 weeks will include women in the CI for some sites that will be excluded from other sites. Variation can be caused by either ability to schedule at 41+0 weeks instead of day or 2 beyond, or to record gestation in days instead of completed weeks. Further investigation is required into reasons for increased rates over time and difference in rates across states.

Increased rates, and differences between private and public hospitals and between jurisdictions for **CI 1.3**, for a risk-adjusted group of women, remains concerning.

The College's comments for **CI 1.1**, regarding the private and public breakdown, remain relevant and would be useful for all CIs across the range of years. It is difficult to ascertain if strategies across the public and private sector are working to influence change.

The increasing rate and statistically significant differences between public and private hospitals in rates of **CI 1.4** are concerning. Many public maternity services have implemented targeted support for women's choice of mode of birth after their first caesarean section. Prevention of first caesarean, if targeted, is not reflected in these data.

Vaginal birth after caesarean section (VBAC)

CI 2.1 does not enable a review of outcomes of programs that provide support for informed birth choices following a first caesarean. Therefore, it is difficult to make any real comment due to the lack of available evidence around VBAC.

A number of public health services are implementing such services demonstrated by Shorten *et al.* (2013)¹ leading to the reflection that if VBAC is not the optimal outcome of such support programs, this CI may need to be re-defined to report on achievement of women's informed preference for second birth.

However, it is disappointing to see the rate reducing due to lack of evidence when perhaps it should be moving in a more positive direction in order to gain more evidence. What is unclear is the number of women who attempt a VBAC as a comparison.

Major perineal tears & surgical repair of the perineum

CI 3.1 data for no trauma to perineum at vaginal birth has worsened in 2013 for selected primiparous women. The reduction in proportion of this outcome is almost completely mirrored by an increase in proportion of these women having an episiotomy suggesting that use of episiotomy was less restrained in 2013. Lack of evidence makes it difficult to make significant comments regarding an acceptable rate.



The College finds it difficult to comprehend why **CI 3.2** continues to increase when there is no significant corresponding decrease in third or fourth degree tears. The proportion of selected primiparous women having an episiotomy increased over the period reported. Most of this increase was mirrored by a decrease in the proportion of women with an intact perineum suggesting that increased episiotomy rates have not decreased perineal trauma. The higher episiotomy rate in private hospitals may reflect a higher rate of obstetric attendant and reflect the findings of Shorten *et al.* (2002)² where birth position and midwife accoucheur was protective of perineum. When comparing jurisdictional strata, states with low episiotomy rates did not have low perineal tear rates in comparison with other states.

CI 3.3 has not varied over period reported, particularly in last three years. The College's comments for **CI 3.4** are similar to those for **CI 3.2**. It is unsure why this rate is also increasing, however it may be a practice issue due to the wide discrepancy in rates among the different states.

While **CI 3.2**, **CI 3.3** and **CI 3.4** have varied little over the period reported, statistical differences between jurisdiction results are evident. Except for NSW, states with lower episiotomy rates have higher perineal trauma with or without episiotomy. This equilibrium achieved in NSW in 2013 invites observation.

In regard to **CI 3.5**, recognition and appropriate treatment for third degree trauma is important. Whether women suffering third degree trauma also had an episiotomy is not clear.

Though the reduction in the rate of **CI 3.6** over the period reported is encouraging, recognition and appropriate treatment for fourth degree trauma is important. Whether women suffering fourth degree trauma also had an episiotomy is not clear.

General anaesthesia for caesarean section

The rates of **CI 4.1** have remained very low, although there is a slight increase in the 2013 data at 6.44%. The highest rate of general anaesthetic use continued to be in public hospitals. This is to be expected in the public sector, as the most complex cases are cared for in public HCOs. Furthermore, this reflects the acuity of public women undergoing caesarean section and the higher rate and urgency of emergency caesarean sections often experienced in these services.³

Antibiotic prophylaxis & caesarean section

2012 saw a significant improvement in the rate of **CI 5.1**, however the increase appears to have plateaued in 2013. The rate is now very high so little gains here should be considered worthwhile. Continued high rates of prophylactic antibiotics reflect success of hospital policy implementation.

Pharmacological thromboprophylaxis & caesarean section

It should be noted that **CI 6.1** is now a changed CI and differs from **CI 6.1** that was previously reported. It is important that this is noted so that comparisons are not made from last year's reporting. The Australian College of Midwives notes that only 58 HCOs have reported data for this CI so it is difficult at this early stage to make much comment. It is disappointing that the rates are so different between the public and private reporting institutions and flags an area of work that may be required for private institutions.

Implementation of policy, procedure and uniform practice for prophylactic thromboprophylaxis has been difficult and not uniform across health services. Results for future periods are of interest. Private hospitals have half the rate of public hospitals, which may reflect difference in policy and / or acuity of women undergoing caesarean section.

It is disappointing that **CI 6.2** is only reported for 2013. This rate should be 100% and it is a shame there is such a discrepancy between public and private HCOs. Again, implementation of policy, procedure and uniform practice for prophylactic thromboprophylaxis has been difficult and not uniform across health services, and results for future periods are of interest. Private hospitals have half the rate of public hospitals which may reflect differences in policy and / or acuity of women undergoing caesarean section.



Postpartum haemorrhage / blood transfusion

Rates of blood transfusion following vaginal birth in **CI 7.1** continue to rise with public sites having twice the proportion of women transfused as private sites. Acuity in public services contributes to this difference. The rate of blood transfusions following caesarean sections in **CI 7.2** decreased in the last two years. Public sites continue to have twice the proportion of women transfused as private sites. Acuity in public services contributes to this difference.

As with other Obstetric CIs where differences between jurisdictions are seen with differences between public and private strata, the effect of a high proportion of private maternity services in a jurisdiction must be considered.

Intrauterine growth restriction (IUGR)

It remains important to monitor rates of intrauterine growth restriction through monitoring birth weight at 40 weeks gestation and beyond. **CI 8.1**, however, should not become a driver for increasing numbers of scans and intrauterine investigations. It is promising to see this rate continues to fall.

This continued decrease in value may reflect increased quality of antenatal care and fetal assessment. It is not reflected by a decrease in term infant admission to Special Care Nursery or low Apgar score (**CI 9.1** and **CI 10.1**).

Apgar score

While the rates for term babies with an Apgar score of < 7 at 5 minutes post-delivery remain low (**CI 9.1**) at 1.32%, it appears that this rate continues to rise slowly each year. The public HCO rate is twice as high as the private HCO rate.

This may reflect the acuity and risk factors of women giving birth in public services, but results require further stratification to determine risk factors. The subjective nature of Apgar scores cannot be ignored, so stratification by other infant wellbeing determinants would be recommended, such as cord blood gas analysis.

Admission of term babies to NICN or SCN

The rate of **CI 10.1** continued to increase over the period reported. This is concerning considering increased intervention in labour and birth with the expectation of healthier infants following birth.

Peer review of serious adverse events

CI 11.1 is a difficult CI to report and this possibly explains why so few of the HCOs report on this CI.

An increased proportion of adverse events reviewed over the period the CI has been reported is encouraging. The lower rate in non-metropolitan areas reflects the difficulty experienced by services working in geographically challenging areas.

General comments

The number of services reporting for each CI indicates the ease or difficulty of recording and reporting data defined and possibly the usefulness of the measure to local practice monitoring.

Comparison of local results with the mean and stratified groups would enable health services and professionals to determine areas for policy, practice and research attention.

References

1. Shorten, A., Shorten, B. and Kennedy, H. P. (2013), Exploring Women's Values, Choices, Expectations, and Outcomes for Birth After Caesarean. *Journal of Midwifery & Women's Health*, 58: 585–586. doi: 10.1111/jmwh.12122
2. Shorten, A., Donsante, J. and Shorten, B. (2002), Birth Position, Accoucheur, and Perineal Outcomes: Informing Women About Choices for Vaginal Birth. *Birth*, 29: 18–27. doi: 10.1046/j.1523-536X.2002.00151.x
3. McDonnell, N.J., Paech, M.J., Clavisi, O.M. and Scott, K.L. (2008), Difficult and failed intubation in obstetric anaesthesia: an observational study of airway management and complications associated with general anaesthesia for caesarean section. *International Journal of Obstetric Anaesthesia*, 17:4: 292–97. <http://dx.doi.org/10.1016/j.ijoa.2008.01.017>



Ophthalmology

VERSION 5

Cataract surgery

CI 1.1 Cataract surgery – readmission within 28 days

(L) In 2013, there were 50,121 patients reported from 58 HCOs. The annual rate was 0.19 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 54 fewer readmissions within 28 days, corresponding to a reduction by approximately one-half. There were two outlier records from one HCO whose combined excess was 30 more readmissions within 28 days. The outlier HCO rate was 0.79 per 100 patients.

CI 1.2 Cataract surgery – readmission within 28 days due to endophthalmitis (L)

(L) In 2013, there were 54,792 patients reported from 54 HCOs. The annual rate was 0.022 per 100 patients. The fitted rate improved from 0.064 to 0.024, a change of 0.041 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.018 per 100 patients. There were no potential gains in 2013. There were two outlier records from one HCO whose combined excess was two more readmissions within 28 days due to endophthalmitis. The outlier HCO rate was 0.017 per 100 patients.

CI 1.3 Cataract surgery – unplanned overnight admission (L)

(L) In 2013, there were 48,915 patients reported from 55 HCOs. The annual rate was 0.45 per 100 patients. The fitted rate improved from 0.65 to 0.47, a change of 0.18 per 100 patients. The potential gains totalled 195 fewer patients who had an unplanned overnight admission, corresponding to a reduction by approximately four-fifths. There were 11 outlier records from eight HCOs whose combined excess was 87 more patients who had an unplanned overnight admission. The outlier HCO rate was 1.5 per 100 patients.

CI 1.4 Cataract surgery – anterior vitrectomy (L)

(L) In 2013, there were 60,085 patients reported from 58 HCOs. The annual rate was 0.56 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 145 fewer patients having an anterior vitrectomy, corresponding to a reduction by approximately one-third. There were five outlier records from five HCOs whose combined excess was 59 more patients having an anterior vitrectomy. The outlier HCO rate was 1.8 per 100 patients.

Intraocular glaucoma surgery

CI 2.1 Intraocular glaucoma surgery – readmission within 28 days (L)

(L) In 2013, there were 1,298 patients reported from 18 HCOs. The annual rate was 4.2 per 100 patients. The fitted rate deteriorated from 1.4 to 4.8, a change of 3.4 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 3.2 per 100 patients. In 2013, the potential gains totalled 43 fewer readmissions within 28 days, corresponding to a reduction by approximately four-fifths. There were two outlier records from two HCOs whose combined excess was ten more readmissions within 28 days. The outlier HCO rate was 14.0 per 100 patients.

CI 2.2 Glaucoma surgery – re-admission within 28 days due to endophthalmitis (L)

(L) In 2013, there were 1,298 patients reported from 18 HCOs. The annual rate was 0 per 100 patients. There was no significant trend in the fitted rate. There were no potential gains in 2013.

CI 2.3 Intraocular glaucoma surgery – LOS exceeded 3 days (L)

(L) In 2013, there were 955 patients reported from 11 HCOs. The annual rate was 2.2 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 16 fewer patients with a LOS greater than 3 days following glaucoma surgery, corresponding to a reduction by approximately three-quarters. There were two outlier records from one HCO whose combined excess was 15 more patients with a LOS greater than 3 days following glaucoma surgery. The outlier HCO rate was 9.8 per 100 patients.

Retinal detachment surgery

CI 3.1 Retinal detachment surgery – readmissions within 28 days (L)

(L) In 2013, there were 4,165 patients reported from 13 HCOs. The annual rate was 3.9 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 58 fewer readmissions within 28 days, corresponding to a reduction by approximately one-third. There was one outlier record from one HCO whose combined excess was 33 more readmissions within 28 days. The outlier HCO rate was 10.6 per 100 patients.

CI 3.2 Retinal detachment surgery – readmission within 28 days due to endophthalmitis (L)

(L) In 2013, there were 4,102 patients reported from 12 HCOs. The annual rate was 0.073 per 100 patients. There was no significant trend in the fitted rate. There were no potential gains in 2013.



CI 3.3 Retinal detachment surgery – LOS exceeded

4 days (L) In 2013, there were 3,984 patients reported from nine HCOs. The annual rate was 0.28 per 100 patients. The fitted rate improved from 1.8 to 0.40, a change of 1.4 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.0 per 100 patients. There were no potential gains in 2013.

CI 3.4 Retinal detachment surgery – unplanned reoperation within 28 days (L)

In 2013, there were 3,542 patients reported from 12 HCOs. The annual rate was 1.4 per 100 patients. The fitted rate improved from 4.1 to 1.7, a change of 2.4 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.8 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There was one outlier record from one HCO whose combined excess was 3 more patients having an unplanned reoperation within 28 days. The outlier HCO rate was 7.7 per 100 patients.

Toric intraocular lens implantation

CI 4.1 Intraocular lens implantation – planning record at time of surgery (H)

In 2013, there were 5,193 patients reported from nine HCOs. The annual rate was 100 per 100 patients. There were no potential gains in 2013.

CI 4.2 Toric lens implantation (N) In 2013, there were 5,193 lens implants reported from nine HCOs. The annual rate was 29.2 per 100 lens implants.

CI 4.3 Toric intraocular lens implantation – planning record at time of surgery (H)

In 2013, there were 1,518 patients reported from eight HCOs. The annual rate was 100 per 100 patients. There were no potential gains in 2013.

Expert Commentary

Royal Australian and New Zealand College of Ophthalmologists (RANZCO)

RANZCO supports the increasing trend towards self-audit by individual ophthalmologists.

Cataract surgery

Rates of readmission following cataract surgery continue to remain low (**CI 1.1**). Causes of readmission include endophthalmitis, vitrectomy for dropped nuclear fragments and rotation of Toric Intraocular Lenses (IOLs).¹

Endophthalmitis remains a relatively rare complication and the use of intracameral antibiotics may reduce further the rates of this complication.^{2,3} The use of Toric IOLs is increasing and readmission rates may increase in the future to correct positioning.⁴

HCOs submitting data continue to report a reduction in the annual rates of endophthalmitis after cataract surgery (**CI 1.2**). The use of intracameral antibiotics is likely to continue to increase and this may have a favourable effect on the incidence of this complication.

Unplanned overnight admission rates following cataract surgery were lower in 2013 with a reduction in the annual rate (**CI 1.3**). There are known factors such as older age groups, medical co-morbidities and surgery in the latter part of the day that may be contributing.^{5,6}

In 2013, there were eleven outlier submissions from eight different HCOs. The outlier organisations can consider a grading / points system based on case complexity to identify cases that should be done in the morning or by an experienced surgeon.⁷

There continues to be a considerable variation between HCOs submitting data for **CI 1.4**. The factors that would primarily affect rates of posterior capsular rupture, and therefore anterior vitrectomy rates during cataract surgery, continue to include surgeon expertise, whether there is a residency program and case load of complex cataracts.^{7,8}



HCOs with training programs are more likely to report complications as this is related to overall surgical experience in cataract surgery. This is to a certain extent unavoidable as there is a need to train the surgeons of the future. However, it may be possible to reduce the learning curve and the number of reported complications through more comprehensive education, case selection and use of new technologies like surgical simulators.⁹

Furthermore, tertiary referral centres are more likely to have more complex caseloads due to other medical co-morbidities and are more likely to report complications after cataract surgery. Other units may be referring complex patients to these units due to existing medical facilities.

Intraocular glaucoma surgery

There was a slight increase in the rate for **CI 2.1** compared to 2012, the rate now being 4.16%. Two HCOs reported a combined excess of ten readmissions within 28 days. There was also a small reduction in the total denominator although this variation needs to be observed in the coming years to be sure this is a true downward trend. Intraocular glaucoma filtration surgery can effectively reduce intraocular pressure and delay disease progression. It is therefore encouraging to see that there were no readmissions due to endophthalmitis secondary to glaucoma surgery (**CI 2.2**) in the reported cohort for 2013. This is in keeping with low reported rates in the last nine years. The rate for **CI 2.3** is in line with reported rates over the past nine years. There was a significant difference in the two outlier HCOs which reported higher rates of length of stay. This may be related to patient risk factors, other co-morbidities and or social issues that prevented timely discharge from hospital.

Retinal detachment surgery

The rate of **CI 3.1** has been essentially stable since 2006. It is not yet clear whether the monotonic increase in readmissions since the nadir reached in 2009 is related to changes in clinical care. There have not been significant changes in available surgical techniques since 2006, although it is possible that there have been ongoing changes in proportions of scleral buckle procedures and of vitrectomy procedures. It is also possible that an increasing number of surgeons are employing smaller gauge surgical equipment for performing vitrectomy surgery for retinal detachments now than in 2006. Smaller gauge surgery has been associated in some studies with higher rates of endophthalmitis and post-operative hypotony^{1,2,3,4} and it is possible that surgeons with limited experience using small gauge surgery may experience higher rates of these complications.

It is not known whether the total denominator (number of retinal detachments) is increasing due to more complete reporting or due to a change in incidence of the disease.^{10,11,12,13}

The 2013, data for **CI 3.2** shows a similar trend to the previous year with only three cases in 14 reporting HCOs. Hence no increase in the incidence of this complication is evident.

The rate for **CI 3.3** continues to remain close to a historical low of 0.28/100 patients. The number of reporting HCOs is the same as in 2012 and the trend suggests a reduction in the number of prolonged stays in hospital.

The rate for **CI 3.4** has been gradually decreasing. It is not clear whether the disparity in reoperation rates within 28 days between public and private institutions is due to better care in one sector or the other. Given that the anatomical success rate of primary surgery for retinal detachment is in the order of only 85%⁵, the lower rate of reoperation in public hospitals may possibly indicate either better outcomes of primary surgery, or a greater delay between occurrence of surgical failure and reoperation.

Toric Intraocular Lens Implantation

Nine HCOs reported the implantation of Toric IOLs (**CI 4.2**). These lenses are becoming popular for the correction of astigmatism during cataract surgery. The annual rate of 29.2/100 lens implants is likely to increase and future data should show if this is the case.



References

1. Lundström M, Barry P, Henry Y, *et al.* Evidence-based guidelines for cataract surgery: guidelines based on data in the European Registry of Quality Outcomes for Cataract and Refractive Surgery database. *J Cataract Refract Surg.* 2012 Jun;38(6):1086-93.
2. Friling E, Lundström M, Stenevi U, Montan P. Six-year incidence of endophthalmitis after cataract surgery: Swedish national study. *J Cataract Refract Surg.* 2013 Jan;39(1):15-21.
3. Kam J, Sandhu S, Allen P. Routine prophylactic antibiotic use by ophthalmologists performing cataract surgery in Victoria [poster abstract 1]. *Clin Exp Ophth* 2012, 40(S1): 63-188
4. Rubenstein JB, Raciti M. Approaches to corneal astigmatism in cataract surgery. *Curr Opin Ophthalmol.* 2013 Jan;24(1):30-4.
5. Cortiñas M, Martínez LL, Granados JM, Puerto N, Méndez M, Lizán-García M, López-Moya J. Results of an outpatient major surgery program in ophthalmology. *Arch Soc Esp Oftalmol.* 2006 Dec;81(12):701-8.
6. Elder M, Steven D, Beasley S, Wium D. Unplanned overnight hospital admission after strabismus surgery. *N Z Med J.* 2007 Aug 24;120(1260)
7. Muhtaseb M, Kalhor A, Ionides A. A system for preoperative stratification of cataract patients according to risk of intraoperative complications: a prospective analysis of 1441 cases. *Br J Ophthalmol.* 2004 Oct;88(10):1242-6.
8. Blomquist PH, Morales ME, Tong L, Ahn C. Risk factors for vitreous complications in resident-performed phacoemulsification surgery. *J Cataract Refract Surg.* 2012 Feb;38(2):208-14
9. Pokroy R, Du E, Alzaga A, Khodadadeh S, Steen D, Bachynski B, Edwards P. Impact of simulator training on resident cataract surgery. *Graefes Arch Clin Exp Ophthalmol.* 2013 Mar;251(3):777-81.
10. Acar N, Kapran Z, Unver YB, Altan T, Ozdogan S. Early postoperative hypotony after 25-gauge sutureless vitrectomy with straight incisions. *Retina.* 2008;28(4):545-552. (www.ncbi.nlm.nih.gov/pubmed/18398355)
11. Byeon SH, Lew YJ, Kim M, Kwon OW. Wound leakage and hypotony after 25-gauge sutureless vitrectomy: factors affecting postoperative intraocular pressure. *Ophthalmic Surg Lasers Imaging.* 2008;39(2):94-99. (www.ncbi.nlm.nih.gov/pubmed/18435331)
12. Kunimoto DY, Kaiser RS. Incidence of endophthalmitis after 20- and 25-gauge vitrectomy. *Ophthalmology.* 2007;114(12):2133-2137. (www.ncbi.nlm.nih.gov/pubmed/?term=17916378)
13. Scott IU, Flynn HW, Jr., Dev S *et al.* Endophthalmitis after 25-gauge and 20-gauge pars plana vitrectomy: incidence and outcomes. *Retina.* 2008;28(1):138-142. (www.ncbi.nlm.nih.gov/pubmed/?term=18185150)

Expert Commentary

Australian Ophthalmic Nurses Association NSW (AONA)

Introductory comments

The National Safety and Quality Health Service Standards (NSQHSS) have encouraged the development of antimicrobial stewardship in all HCOs.

AONA recommends a national approach to monitoring of the rates of endophthalmitis and Toxic Anterior Syndrome rates be incorporated into this process. Increased numbers of intravitreal injection procedures for macular degeneration and diabetic retinopathy should also be included in this data collection not just relative to post-surgery.

Victoria has had a state-wide data collection for over 12 years providing a strong evidence base to ensure public and private feedback and appears to be in discussion with RANZCO to move the data collection points beyond the public hospital space.

Cataract surgery

The College notes that rates for readmission after cataract surgery (**CI 1.1**) continue to remain low, similar to **CI 1.2**, possibly due to the continued use of betadine and intracameral antibiotics. In regard to **CI 1.4**, anterior vitrectomy trends continue with slight variation between private and public centres with more inexperienced surgeons.

Intraocular glaucoma surgery

The College notes no significant changes.

Retinal detachment surgery

The College notes no significant changes.

General comments

If the collection of the intraocular lens implantation CIs, including Toric lenses data, is a challenge it would be understandable if HCOs decided not to report on this CI.

Endophthalmitis evidence varies in reporting systems and collection points. Victoria has a state-wide data collection (over 12 years). Increased numbers of intravitreal injections for AMD are widely performed and AONA believes it is important to have a national approach to endophthalmitis data collection. This data collection may be via the NSQHSS or perhaps RANZCO.





Oral Health

VERSION 3

Unplanned returns to the dental centre

CI 1.1 Restorative treatment – teeth retreated within 6 months (L) In 2013, there were 110,573 teeth restored reported from 12 HCOs. The annual rate was 5.5 per 100 teeth restored. The potential gains totalled 1,959 fewer teeth retreated within 6 months, corresponding to a reduction by approximately one quarter. There were four outlier records from two HCOs whose combined excess was 622 more teeth retreated within 6 months. The outlier HCO rate was 9.4 per 100 teeth restored.

CI 1.2 Routine extraction – complications within 7 days (L) In 2013, there were 47,409 attendances for simple extractions reported from 12 HCOs. The annual rate was 1.6 per 100 attendances for simple extractions. The potential gains totalled 300 fewer attendances for complications within 7 days, corresponding to a reduction by approximately one-third. There were four outlier records from two HCOs whose combined excess was 87 more attendances for complications within 7 days. The outlier HCO rate was 4.1 per 100 attendances for simple extractions.

CI 1.3 Surgical extraction – complications within 7 days (L) In 2013, there were 3,766 attendances for surgical extractions reported from eight HCOs. The annual rate was 1.8 per 100 attendances for surgical extractions. The potential gains totalled 47 fewer attendances for complications within 7 days, corresponding to a reduction by approximately two-thirds. There was one outlier record from one HCO whose combined excess was 18 more attendances for complications within 7 days. The outlier HCO rate was 3.7 per 100 attendances for surgical extractions.

CI 1.4 Denture Remakes (L) In 2013, there were 7,568 dentures reported from 13 HCOs. The annual rate was 2.6 per 100 dentures. The fitted rate improved from 3.0 to 2.4, a change of 0.58 per 100 dentures. The potential gains totalled 36 fewer dentures remade within 12 months, corresponding to a reduction by approximately one-tenth.

Endodontic treatment

CI 2.1 Endodontic treatment – same tooth within 6 months of initial treatment (H) In 2013, there were 3,445 treatments reported from six HCOs. The annual rate was 49.1 per 100 treatments. The potential gains totalled 548 more completed courses of endodontic treatment. There were two outlier records from one HCO whose combined excess was 84 fewer completed courses of endodontic treatment. The outlier HCO rate was 21.5 per 100 treatments.

CI 2.2 Endodontic treatment – teeth extracted within 12 months (L) In 2013, there were 6,723 teeth reported from nine HCOs. The annual rate was 5.5 per 100 teeth. The potential gains totalled 142 fewer extractions, corresponding to a reduction by approximately one-third.

Children's dental care

CI 3.1 Restorative treatment (children) – teeth retreated within 6 months (L) In 2013, there were 42,985 teeth reported from five HCOs. The annual rate was 2.7 per 100 teeth. The potential gains totalled 706 fewer retreatments, corresponding to a reduction by approximately one-half. There were three outlier records from two HCOs whose combined excess was 51 more retreatments. The outlier HCO rate was 5.9 per 100 teeth.

CI 3.2 Pulpotomy (children) – deciduous teeth extracted within 6 months (L) In 2013, there were 2,298 teeth reported from five HCOs. The annual rate was 3.7 per 100 teeth. The potential gains totalled 65 fewer extractions, corresponding to a reduction by approximately three-quarters. There was one outlier record from one HCO whose combined excess was 13 more extractions. The outlier HCO rate was 15.0 per 100 teeth.

CI 3.3 Fissure sealant treatment (children) – re-treatment within 24 months (L) In 2013, there were 83,498 teeth reported from six HCOs. The annual rate was 2.6 per 100 teeth. The potential gains totalled 156 fewer retreatments, corresponding to a reduction by approximately one fifteenth. There were three outlier records from two HCOs whose combined excess was 81 more retreatments. The outlier HCO rate was 4.0 per 100 teeth.

Radiographs

CI 4.1 Radiographs (bite-wing) that meet all 8 criteria (H) In 2013, there were 127 bite-wing radiographs reported from two HCOs. The annual rate was 67.7 per 100 bite-wing radiographs. The potential gains totalled 12 more bite-wing radiographs that met the criteria.



Expert Commentary

Chairperson, ACHS Oral Health Clinical Indicator Working Party

Introductory Comments

The Chairperson of the Oral Health CI Working Party welcomes the updated results for 2013, noting that many of the CI results represent only two years of observation. This is because of the significant revision in Version 3 of the CI set which applied from 2012. It is pleasing that most results are fundamentally the same as past years, and that gathering the evidence over time will reinforce the benefits of the clinical discussions and reflection on good practice that comes with reviewing the data.

Unplanned returns to the dental centre

The 2013 aggregate rate for **CI 1.1** is essentially the same as 2012, but improvements in both the 20th and 80th centile rates are noted. The 12 submitting HCOs' data are all submissions from public oral health service provider organisations that provide dental care to only the most disadvantaged groups in the community. As such, these dental clients present with poorer general health and oral health, and often with more complex needs. Public dental patients often are presenting for emergency dental care or via waiting lists of varying lengths, and as such their dental care needs may be different from those of the general population.

The rate for **CI 1.2** remains stable across both 2012 and 2013, at about 1.5 per 100 visits, or once in every 65 visits where extraction procedures are provided to public dental patients. There is some variability noted between HCOs, and the 80th centile rate of about 3.0 identifies opportunities for review of practice and procedures at two medium-sized HCOs, where the outlier HCO rate is just above 4 patients per 100 dental extraction visits returning.

The mean aggregate rate for **CI 1.3** remains at less than 2 returns per 100 surgical extraction visits, which is within clinically acceptable limits for these often complex procedures, and the rate improved slightly in 2013 when compared with previous results. Seven public HCOs and one private dental practice organisation submitted data during 2013 for this measure.

The long-term trend since 2006 for denture remakes (**CI 1.4**) is very positive, improving from above three in 2006 and 2008, to be sustained at levels of below 2.66 across each of the past five years. The provision of dentures to mostly very elderly pensioners in the public dental sector clinics involves provision of functionally sound and aesthetically pleasing replacements for missing or no teeth for a large group of patients with often complex medical and social issues. The 13 public HCOs provided more than 7,500 dentures last year, with fewer than 200 reported returns for remake. This is a very positive result, as providing successful dentures for elderly clients, which offer improved functional capability to eat and speak and are aesthetically pleasing replacements for teeth previously extracted, often many years before, is a challenge.

Endodontic treatment

There are no significant differences in **CI 2.1** between 2012 and 2013 results, where about half of the clients who had endodontic (root canal) treatment commenced in some public sector clinics had these teeth successfully endodontically completed within 6 months. Clinical practice guidelines recommend prompt completion for these treatments. There are a number of factors that may be at play in determining why this rate is not higher. Clients may choose not to have the procedure completed and subsequently have the tooth

extracted, some teeth commenced may take longer than 6 months to be completed and some patients may not return to the same provider / practice, and seek further or alternate care elsewhere. Public sector operational and policy factors for both emergency and general care services may also contribute in addition to the cost or co-payment of endodontic treatments, as affordability has been identified as an important factor in dental care provision for low income earners and Centrelink cardholders.¹

There is a small reported positive improvement for **CI 2.2** from 5.9 to 5.5 percent of teeth, where root canal treatments are commenced at public oral health service clinics, subsequently being extracted within a year.

Children's dental care

All HCOs reporting in this children's CI (**CI 3.1**) area identify as public dental services. There are no significant differences between the rates in 2012 and 2013, which were 2.6 and 2.7 teeth retreated per 100 restored teeth, respectively. This rate is approximately half that of the similar adult CI (**CI 1.1**).

Pulp treatments aim to save compromised teeth, but a number of treated deciduous (baby) teeth will subsequently require extraction due to ongoing pathology. Extraction following pulp treatment in deciduous teeth (**CI 3.2**) that are eventually going to exfoliate is sometimes required to remove the cause of the infection.

The current rate of less than four (3.7) teeth per 100 receiving pulp treatment, is similar to the average rate between 2010 and 2012 (3.6), and has substantially improved since 2010, when rates were between 6% and 12% for three of the preceding four years.



The current very low rate of 2.6 teeth requiring restoration within 2 years (**CI 3.3**) from every 100 fissure sealed teeth is a positive result, maintained at this level since 2010. The data are heavily weighted towards one large public HCO which supplied about 82% of cases, and returned excellent results. This HCO therefore skews the results and perhaps artificially moves some of the other small submitting HCOs results to just outside the funnel plot (outliers).

Preventive services, such as fissure sealants, are a proven public health and non-invasive clinical preventive measure in the control of tooth decay for children at risk. A very low retreatment rate of about or below 2.6 per 100 teeth has been sustained for the past four years by these five or six public HCOs.

Radiographs

Very few HCOs contributed data for **CI 4.1**. The data from all other CI areas can be calculated using a database report from electronic patient records information systems, but **CI 4.1** requires a visual review of each case / radiograph against the eight assessment criteria. This is a time-consuming manual review process that may be perceived to be a barrier to collection. It is probably the main reason why more HCOs do not contribute to this specific CI.

General comments

Most of the rates are sustained at very low and clinically acceptable levels, except for **CI 2.1**, which at about half (49/100) still demonstrates substantial potential for improvement for this single CI.

Public sector HCOs are currently, almost exclusively, the primary users of the Oral Health CIs, and each will benefit from longer term data collection of the Version 3 CIs, and where warranted some more detailed local internal analysis of the underlying contributing factors described in these broad, high-level measures.

Response rates

Up to 13 different HCOs have contributed to the 2013 results. The relatively small number of HCOs participating in the Oral Health CI Program is not reflective of the commitment of dental care providers, and in particular the state and territory public dental services, to maintaining high quality standards of clinical care and to striving for continuous improvements in patient care and service delivery. Some individual HCOs submitting oral health data represent an aggregate of a large number of individual public dental clinics as a single organisation. The size of the HCOs submitting dental data also varies widely.

It is noted that all but one of the HCOs submitting data in 2013 are from the public sector, with only one non-public HCO submitting data for just one measure (**CI 1.3**).

Quality improvement

Whilst benchmarking and peer comparisons are valuable, the most important use of the CIs is for HCOs to strive for continuous improvement and compare themselves against their previous results over time.

These national results identify some potential for improvement, noted especially in the reported outliers being mainly from medium-sized HCOs, and the excellent rates of the 20th centile sites.

References

1. AIHW: www.aihw.gov.au/dental/cost/



Paediatrics

VERSION 4.1

Paediatric – general

CI 1.1 Documented immunisation status (H) In 2013, there were 4,790 inpatients reported from 16 HCOs. The annual rate was 92.6 per 100 inpatients. The fitted rate improved from 88.3 to 89.7, a change of 1.4 per 100 inpatients. The potential gains totalled 279 more infants admitted for whom there was a documented current immunisation status. There were four outlier records from three HCOs whose combined excess was 137 fewer infants admitted for whom there was a documented current immunisation status. The outlier HCO rate was 80.9 per 100 inpatients.

CI 1.2 Planned or catch-up immunisation (H) In 2013, there were 443 inpatients reported from 14 HCOs. The annual rate was 73.1 per 100 inpatients. The fitted rate improved from 59.7 to 66.1, a change of 6.4 per 100 inpatients. The potential gains totalled 60 more infants for whom there was documented evidence that they were either given catch-up immunisation or that such immunisation was planned. There were three outlier records from three HCOs whose combined excess was 30 fewer infants for whom there was documented evidence that they were either given catch-up immunisation or that such immunisation was planned. The outlier HCO rate was 29.1 per 100 inpatients.

Paediatric – asthma

CI 2.1 Asthma – average LOS (L) In 2013, there were 48 submissions from 25 HCOs. The average length of stay was 1.7 days.

CI 2.2 Primary diagnosis of asthma – average LOS, excluding same-day admissions (L) In 2013, there were 48 submissions from 25 HCOs. The average length of stay was 1.9 days.

CI 2.3 Readmissions to hospital for asthma within 28 days of discharge (L) In 2013, there were 5,978 separations reported from 30 HCOs. The annual rate was 4.1 per 100 separations. The fitted rate improved from 4.4 to 3.8, a change of 0.62 per 100 separations. The potential gains totalled 141 fewer readmissions to hospital for asthma within 28 days, corresponding to a reduction by approximately one-half. There were three outlier records from two HCOs whose combined excess was 54 more readmissions to hospital for asthma within 28 days. The outlier HCO rate was 10.0 per 100 separations.

Utilisation of patient assessment systems

CI 3.1 Participation in the ANZICS CORE Paediatric Patient Database (PPD) (H) In 2013, there were 2,386 admissions reported from two HCOs. The annual rate was 99.9 per 100 admissions. There was relatively little variation between HCOs and so the potential gains were small in 2013.

CI 3.2 Participation in the ANZICS CORE Critical Care Resources survey (N) In 2012 and 2013, there was one report from 1 HCO which replied in the affirmative.

Access and exit block to the ICU

CI 4.1 Paediatric ICU – non-admission due to inadequate resources (L) In 2013, there were 1,051 patients reported from one HCO. The annual rate was 1.0 per 100 patients. There were no potential gains in 2013.

CI 4.2 Paediatric ICU – elective surgery deferred due to bed unavailability (L) In 2013, there were 2,558 admissions reported from three HCOs. The annual rate was 1.8 per 100 admissions. The potential gains totalled 37 fewer elective surgical cases deferred or cancelled, corresponding to a reduction by approximately four-fifths. There were two outlier records from one HCO whose combined excess was 28 more elective surgical cases deferred or cancelled. The outlier HCO rate was 20.2 per 100 admissions.

CI 4.3 Paediatric ICU – transfer due to bed unavailability (L) In 2013, there were 1,040 patients reported from one HCO. The annual rate was 0 per 100 patients. There were no potential gains in 2013.

CI 4.4 Paediatric ICU – discharge delay exceeded 12 hours (L) In 2013, there were 1,339 patients reported from one HCO. The annual rate was 4.6 per 100 patients. There were no potential gains in 2013.

CI 4.5 Paediatric ICU – discharge between 6pm and 6am (L) In 2013, there were 2,390 patients reported from two HCOs. The annual rate was 11.3 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013.

Intensive care patient management

CI 5.1 Paediatric ICU – unplanned re-admission within 72 hours (L) In 2013, there were 2,375 admissions reported from two HCOs. The annual rate was 1.7 per 100 admissions. There was relatively little variation between HCOs and so the potential gains were small in 2013.



Expert Commentary

Paediatrics and Child Health Division of Royal Australasian College of Physicians (RACP)

Paediatric – general

In regard to **CI 1.1** and **CI 1.2**, it is pleasing that more facilities are contributing immunisation documentation data. The data from this area show that documentation of immunisation status for children in Australian hospitals is being well recorded with a steady increase since 2006. Currently in these facilities 92.6% of admitted children have documentation of their immunisation status. Catch-up immunisation also appears to be increasing in those participating facilities with 73.1% of non-immunised infants receiving or having a planned catch-up immunisation. It is hoped that catch-up for other age groups is also occurring. There is variability with catch-up rates with some facilities only able to give 29.1% of catch-up immunisation for at-risk infants.

Improving immunisation rates is one of the Strategic Priority areas of the National Immunisation Strategy for Australia 2013 – 2018. High immunisation rates remain important for the nation to have low vaccine-preventable disease burden. Catch-up immunisation is an important part of not just providing, but also promoting, immunisation uptake.¹

Paediatric – asthma

The trend for fewer facilities to report asthma data is concerning, particularly as there is an increase in the number of asthma admissions to these facilities. The average length of stay (**CI 2.1**) remains constant, whilst the overnight length of stay had a slight increase. It would be interesting to see if this reflected more short-stay units being developed and utilised for the treatment of childhood asthma. It would also be of benefit to look at the total numbers of asthma admissions that are less than 24 hours and those which are longer to see if the introduction of the National Emergency Access Targets has also had an impact on the model of care for childhood asthma.

The annual readmission rate for asthma (**CI 2.3**) is 4.1 per 100 discharges. Again, as was the case in the previous year, significant state variability is seen with lower readmission rates in Queensland. There is also an interesting divergence of rates between metropolitan and non-metropolitan facilities with fewer readmissions in non-metropolitan sites. The reasons for this are probably complex and reflect healthcare utilisation.

Utilisation of patient assessment systems

Two facilities provided data for **CI 3.1**. They both showed high rates of participation which reflects the accreditation of these sites. This is probably not a relevant CI. Use of patient early warning tools may be a better reflection of patient assessment.

Access and exit block to the ICU

There is only data for **CI 4.1** from a single site looking at both access and exit block, transfers elsewhere and delayed discharge. These data show a reduction in access and exit block in that facility but it is not really a comment on the Australian perspective.

The number of cancellations of surgery due to unavailability of a PICU bed has shown a decrease (**CI 4.2**).

References

1. National Immunisation Strategy for Australia 2013-2018 www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/immunisation-strategy-2013-18-cnt



Expert Commentary

Australian College of Children and Young People's Nurses (ACCYPN)

Paediatric – general

Since 2006, there has been a 27% decrease in the number of HCOs reporting on **CI 1.1**. For those that do report the rate is effectively the same as in 2012: these are reported data. What is not known is if the HCOs collect the data but do not report on it, or do not collect it. The use of nurse immunisers within facilitators has the potential to increase the profile of immunisation as an essential preventive health strategy. The importance of this CI does not diminish despite the reduced reporting rate.

In regard to **CI 1.2**, the national immunisation rate for children aged 12 months to less than 15 months of age as of December 2013 is 90.3%.¹ If this population rate is translated to hospitalised children then 9.7% of children aged 12 months to less than 15 months who are hospitalised are either not up-to-date or unimmunised. The numbers being reported without an up-to-date immunisation status appear to be low when compared with the population figures. Opportunistic vaccination is essential in reducing vaccine preventable morbidity and mortality.

Paediatric – asthma

The number of HCOs providing data for **CI 2.1** has dropped from 43 to 25 (2006 – 2013). These are data that are reported through state reporting processes so it is difficult to understand why the HCOs have ceased reporting. The length of stay remains static. As mentioned in previous years, further change is unlikely without changes in models of care.

The number of HCOs providing data for **CI 2.2** has dropped from 42 to 25 (2006 – 2013). These are data that are also reported through state reporting processes so it is difficult to understand why the HCOs have ceased reporting. The length of stay remains static. As mentioned in previous years, further change is unlikely without changes in models of care.

The readmission rate of 4.1 per 100 separations for **CI 2.3** is similar to 2006 where it was 4.11 per 100 separations. Hospital avoidance and hospital substitution strategies need to be considered if this readmission rate is to be reduced. The use of Advanced Practice Nurses who specialise in asthma management can be used in these strategies.

Utilisation of patient assessment systems

The two HCOs that submitted data for **CI 3.1** have an excellent participation rate of 99.9 per 100 admissions. As the number of HCOs participation has decreased there may be a need for a review of this CI.

As only one HCO submitted data for **CI 3.2**, there may be a need for a review of this CI.

Access and exit block to the ICU

As only one/two HCOs submitted data for **CI 4.1**, **CI 4.3**, **CI 4.4** and **CI 4.5** there may be a need for a review of these CIs.

Whilst there were 37 fewer elective surgery cases cancelled or deferred for **CI 4.2**, there was a reduction of the number of HCOs reporting (5 to 3), again this suggests this CI may need to be reviewed.

Intensive care patient management

As only two HCOs submitted data for **CI 5.1**, there may be a need for a review of this CI.

References

1. www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/acir-curr-data.htm





Pathology

VERSION 3

Chemical pathology

CI 1.1 Serum / plasma potassium from ED or urgent – validated report within 60 mins (H) In 2013, there were 172,384 requests reported from 35 HCOs. The annual rate was 83.9 per 100 requests. The fitted rate improved from 83.1 to 83.8, a change of 0.68 per 100 requests. The potential gains totalled 14,517 more validated serum / plasma potassium report results within 60 minutes. There were 13 outlier records from nine HCOs whose combined excess was 3,919 fewer validated serum / plasma potassium report results within 60 minutes. The outlier HCO rate was 76.9 per 100 requests.

Haematology

CI 2.1 Haemoglobin from ED – received to validated time <40 minutes (H) In 2013, there were 159,913 requests reported from 37 HCOs. The annual rate was 89.8 per 100 requests. The fitted rate improved from 85.2 to 89.8, a change of 4.6 per 100 requests. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 5.3 per 100 requests. In 2013, the potential gains totalled 8,911 more validated haemoglobin reports within 40 minutes. There were 31 outlier records from 15 HCOs whose combined excess was 4,264 fewer validated haemoglobin reports within 40 minutes. The outlier HCO rate was 83.5 per 100 requests.

CI 2.2 Haemoglobin from ED – collected to validated time <60 minutes (H) In 2013, there were 156,853 requests reported from 35 HCOs. The annual rate was 80.3 per 100 requests. There was no significant trend in the fitted rate. The potential gains totalled 17,944 more validated haemoglobin reports within 60 minutes. There were 24 outlier records from 12 HCOs whose combined excess was 8,616 fewer validated haemoglobin reports within 60 minutes. The outlier HCO rate was 58.3 per 100 requests.

CI 2.3 Coagulation from ED – received to validated time <40 minutes (H) In 2013, there were 51,981 requests reported from 37 HCOs. The annual rate was 67.4 per 100 requests. The fitted rate improved from 52.9 to 61.7, a change of 8.8 per 100 requests. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 8.6 per 100 requests. In 2013, the potential gains totalled 5,780 more validated coagulation reports within 40 minutes. There were 11 outlier records from eight HCOs whose combined excess was 2,644 fewer validated coagulation reports within 40 minutes. The outlier HCO rate was 55.4 per 100 requests.

CI 2.4 Coagulation from ED – collected to validated time <60 minutes (H)

In 2013, there were 50,496 requests reported from 35 HCOs. The annual rate was 62.8 per 100 requests. The fitted rate deteriorated from 65.1 to 58.2, a change of 6.9 per 100 requests. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 7.5 per 100 requests. In 2013, the potential gains totalled 8,404 more validated coagulation reports within 60 minutes. There were ten outlier records from seven HCOs whose combined excess was 2,635 fewer validated coagulation reports within 60 minutes. The outlier HCO rate was 33.1 per 100 requests.

Anatomical pathology

CI 3.1 Small biopsy – received to validated time <44 hours (H) In 2013, there were 11,488 biopsies reported from 16 HCOs. The annual rate was 51.8 per 100 biopsies. The fitted rate deteriorated from 63.1 to 54.5, a change of 8.6 per 100 biopsies. The potential gains totalled 3,545 more validated small biopsy results within 44 hours. There were eight outlier records from six HCOs whose combined excess was 1,558 fewer validated small biopsy results within 44 hours. The outlier HCO rate was 16.5 per 100 biopsies.

CI 3.2 Large biopsy – received to validated time <92 hours (H) In 2013, there were 1,251 biopsies reported from 15 HCOs. The annual rate was 47.2 per 100 biopsies. The fitted rate deteriorated from 66.4 to 49.3, a change of 17.1 per 100 biopsies. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 17.9 per 100 biopsies. In 2013, the potential gains totalled 224 more validated large biopsy results within 92 hours. There were four outlier records from three HCOs whose combined excess was 86 fewer validated large biopsy results within 92 hours. The outlier HCO rate was 17.8 per 100 biopsies.

CI 3.3 Small biopsy – collected to validated time <48 hours (H) In 2013, there were 10,508 biopsies reported from 12 HCOs. The annual rate was 49.4 per 100 biopsies. The fitted rate deteriorated from 60.2 to 53.4, a change of 6.8 per 100 biopsies. The potential gains totalled 3,182 more validated small biopsy results within 48 hours. There were six outlier records from four HCOs whose combined excess was 1,540 fewer validated small biopsy results within 48 hours. The outlier HCO rate was 8.6 per 100 biopsies.



CI 3.4 Large biopsy – collected to validated time

<96 hours (H) In 2013, there were 2,960 biopsies reported from 12 HCOs. The annual rate was 54.1 per 100 biopsies. The fitted rate deteriorated from 48.8 to 43.4, a change of 5.4 per 100 biopsies. The potential gains totalled 197 more validated large biopsy results within 96 hours. There were six outlier records from four HCOs whose combined excess was 166 fewer validated large biopsy results within 96 hours. The outlier HCO rate was 18.3 per 100 biopsies.

Microbiology

CI 4.1 CSF from ED, microscopy – validated report

within 40 mins (H) In 2013, there were 762 samples reported from 17 HCOs. The annual rate was 78.6 per 100 samples. The fitted rate improved from 69.6 to 80.3, a change of 10.7 per 100 samples. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 12.0 per 100 samples. In 2013, the potential gains totalled 55 more validated CSF results within 40 minutes. There were two outlier records from two HCOs whose combined excess was 28 fewer validated CSF results within 40 minutes. The outlier HCO rate was 35.1 per 100 samples.

CI 4.2 CSF from ED, microscopy – validated report

within 60 mins (H) In 2013, there were 478 samples reported from 13 HCOs. The annual rate was 62.3 per 100 samples. The fitted rate improved from 58.5 to 75.0, a change of 16.6 per 100 samples. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 16.9 per 100 samples. In 2013, the potential gains totalled 93 more validated CSF results within 60 minutes. There was one outlier record from one HCO whose combined excess was 20 fewer validated CSF results within 60 minutes. The outlier HCO rate was 13.0 per 100 samples.

Expert Commentary

Royal College of Pathologists of Australasia (RCPA)

Introductory Comments

The RCPA has previously commented on the difficulties of relying solely on turnaround times (TATs) as CIs in Pathology. The College welcomes the opportunity to revisit the CIs later this year to make them more pertinent to contemporary practice in laboratory medicine. TATs are playing a less significant role in many areas such as Anatomical Pathology (AP) where quality and accuracy are paramount. Also, TATs are influenced by many factors, which are either outside the control of the pathology service or poorly defined and therefore measured differently across services.

Chemical pathology

The College notes the incremental decrease in TATs within **CI 1.1** 20th and 80th centiles, which likely demonstrates continuing improvements in processes within laboratories. The data show a narrowing of the range indicating a continuing overall improvement. A number of samples collected under the clinical circumstances of an ED will always be unsatisfactory for testing, necessitating a recollection which will result in times outside the range, thus preventing 100% achievement.

Haematology

Similarly to **CI 1.1**, the College notes the decrease in TATs according to trend, 20th and 80th centiles in **CI 2.1**, which likely indicates a continuing overall improvement. A number of samples collected under the clinical circumstances of an ED will always be unsatisfactory for testing necessitating a recollection which will result in times outside the range, thus preventing 100% achievement.



In regard to **CI 2.2**, the College notes overall satisfactory TATs without significant changes. However, TATs show significant improvement in past 12 months in **CI 2.3**. The reason and significance is not clear, given there had been no significant improvement in the previous five years. However, this may represent improvements in laboratory processes.

TATs show slight improvement over the past 4 years within **CI 2.4**, but are still worse than results 5 and 6 years previously. Given the improvements in **CI 2.3**, this may represent issues with either specimen transport or delayed ordering after specimen collection (e.g. telephone addition of coagulation testing after specimen collection and/or transport).

Anatomical pathology

There has been deterioration in TATs within this area. In the ACHS Pathology CI User Manual, there is a large amount of ambiguity in the level of complexity of the biopsies and the scope of possible case-mix selected, as well as the definition of the received time, counting of weekend days etc., rendering the data almost impossible to interpret or give clinical context. As mentioned earlier, TAT, although relevant to an extent, is less important than quality and accuracy in these areas. There is no specific explanation for the NSW data and there appear to be too few respondents for meaningful interpretation.

The aggregate and average rates of **CI 3.2** remain constant, but the range suggests a decrease in performance by some of the outliers.

The data from **CI 3.3** show a narrowing of the range indicating a continuing overall improvement.

Whilst the aggregate and average rates of **CI 3.4** remain constant, the range again suggests a decrease in performance by some of the outliers.

Microbiology

In regard to **CI 4.1**, the average and aggregate rates show improvement suggesting a general improvement in performance. The College notes that it is not appropriate to measure time to gram stain as time to cell count is a far better CI (with gram stain only performed on CSF with a positive white cell count). One consideration which may significantly affect CSF results is time of collection. All laboratories would give CSFs priority during the day, but this may be different out-of-hours, e.g. at night testing may be performed by a scientist who has been called back from home, or by a single multi-skilled scientist who is busy doing an urgent cross-match at the time of receipt. It would be interesting to know if there are differences between within-hours and out-of-hours collections.

Despite the average rate remaining constant with an improvement in the range (suggesting a general improvement in performance particularly by outliers), **CI 4.2** shows a deterioration in TATs.

Given the improvements in **CI 4.1**, this deterioration suggests a potential issue with either specimen transport or delayed ordering after specimen collection, both of which may be outside the control of the laboratory.

General comments

It was noted by the College that the CIs are appropriate. The College is currently developing a framework for internal quality audit in the morphological disciplines via a federal Department of Health-funded project. This and the international literature will inform the development in partnership with ACHS of a new set of CIs which will be of greater value to HCOs in measuring laboratory performance.

Response rate

The number of participating HCOs remains small (43 in total, however it is not known how many CIs each contributed to). Overall the private / public mix, geographical distribution and size of the HCOs would be important factors in interpreting the data and these are not known. Perhaps the College could draw some inferences if it had this information, or perhaps the numbers would be too low to permit this. The low number may reflect the fact that laboratories are accredited via a separate process according to ISO and NPAAC standards for which laboratories collect and measure different, more extensive data.

Quality improvement

The statistical analyses are difficult to interpret and although the interpretations offered by the University of Newcastle are helpful, pathologists and laboratory managers would not understand how they arrived at these conclusions, and their acceptance of their apparent significance would be guarded. For several pathology CIs, numbers are presumably so low that it may not be possible to offer a valid interpretation.



Radiation Oncology

VERSION 3

Consultation process

CI 1.1 Radiotherapy – waiting time exceeded 14 days from the ‘ready for care’ date (L) In 2013, there were 688 patients reported from 15 HCOs. The annual rate was 30.2 per 100 patients. The fitted rate improved from 36.4 to 27.8, a change of 8.7 per 100 patients. The potential gains totalled 127 fewer patients waiting more than 14 days before commencing radiotherapy, corresponding to a reduction by approximately one-half. There was one outlier record from one HCO whose combined excess was nine more patients waiting more than 14 days before commencing radiotherapy. The outlier HCO rate was 65.6 per 100 patients.

CI 1.2 Radiotherapy – documented informed consent (H) In 2013, there were 2,194 patients reported from 13 HCOs. The annual rate was 98.3 per 100 patients. The fitted rate improved from 82.2 to 99.0, a change of 16.8 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 16.7 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were two outlier records from one HCO whose combined excess was 30 fewer patients who had informed consent recorded before receiving radiotherapy. The outlier HCO rate was 60.7 per 100 patients.

CI 1.3 Number of patients entered on prospective clinical trials (H) In 2013, there were 1,523 patients reported from 11 HCOs. The annual rate was 4.2 per 100 patients. The fitted rate deteriorated from 3.5 to 2.6, a change of 0.91 per 100 patients. There were no potential gains in 2013.

Treatment process

CI 2.1 SCC (oral, oropharynx, hypopharynx, larynx) – wait exceeds 6 weeks post-operatively (L) In 2013, there were 45 patients reported from seven HCOs. The annual rate was 17.8 per 100 patients. There was no significant trend in the fitted rate. There was relatively little variation between HCOs and so the potential gains were small in 2013.

CI 2.2 SCC (cervix) – curative chemoradiotherapy (H)

In 2013, there were 70 patients reported from eight HCOs. The annual rate was 85.7 per 100 patients. The fitted rate improved from 62.7 to 81.4, a change of 18.7 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 18.8 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013.

CI 2.3 Patients receiving megavoltage radiotherapy using MLC (H)

In 2013, there were 10,625 patients reported from 12 HCOs. The annual rate was 91.2 per 100 patients. The fitted rate improved from 70.6 to 93.8, a change of 23.2 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 23.3 per 100 patients. In 2013, the potential gains totalled 918 more patients receiving megavoltage radiotherapy using MLC. There were four outlier records from two HCOs whose combined excess was 267 fewer patients receiving megavoltage radiotherapy using MLC. The outlier HCO rate was 82.1 per 100 patients.

CI 2.4 Megavoltage radiotherapy – CT planning (H)

In 2013, there were 7,590 courses reported from 12 HCOs. The annual rate was 99.3 per 100 courses. The fitted rate improved from 80.2 to 99.4, a change of 19.2 per 100 courses. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 18.5 per 100 courses. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were two outlier records from two HCOs whose combined excess was 26 fewer curative megavoltage radiotherapy courses where CT planning was utilised. The outlier HCO rate was 96.1 per 100 courses.

CI 2.5 Radiotherapy – letter on file to referring doctor and/or GP (H)

In 2013, there were 1,506 patients reported from 11 HCOs. The annual rate was 95.5 per 100 patients. The fitted rate improved from 78.5 to 97.2, a change of 18.7 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 17.4 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There was one outlier record from one HCO whose combined excess was four fewer patients who had a letter on file to the referring doctor and/or general practitioner. The outlier HCO rate was 82.6 per 100 patients.



Outcome process

CI 3.1 Glottic cancer (T1-2 N0 M0) radiotherapy – complete follow-up (H) In 2013, there were 73 patients reported from seven HCOs. The annual rate was 84.9 per 100 patients. There was no significant trend in the fitted rate. There were no potential gains in 2013.

CI 3.2 Breast conservation radiotherapy – complete follow-up (H) In 2013, there were 590 patients reported from five HCOs. The annual rate was 84.7 per 100 patients. The fitted rate improved from 67.4 to 82.5, a change of 15.1 per 100 patients. In 2013, the potential gains totalled 85 more patients who had complete follow-up. There was one outlier record from one HCO whose combined excess was nine fewer patients who had complete follow-up. The outlier HCO rate was 64.4 per 100 patients.

Expert Commentary

Faculty of Radiation Oncology, Royal Australasian and New Zealand College of Radiologists (RANZCR)

Consultation process

Waiting time measurement is notoriously unreliable and unstandardised. In the case of **CI 1.1**, it is impossible to say how much of the variation in waiting time data is due to differences in how practices interpret the 'ready for care' date vs. true wait times. True wait times can be caused by inadequate resources or inefficient practice, but the CIs cannot discern reasons behind poor wait time results.

Over the years since 2007, **CI 1.1** suggests that the numbers of patients waiting more than 14 days to commence radiotherapy from their 'ready for care' date has declined. The overall improvement in waiting times may well reflect the increased resources directed toward public rural radiotherapy centres across Australia.

Informed consent documentation for radiotherapy (**CI 1.2**) has improved over the last few years as several states have mandated the use of consent forms prior to commencing any radiotherapy in public institutions. Consent documentation is one item in the RANZCR Peer Review Audit

Tool (PRAT) that is used by radiation oncologists across Australia for continuing professional development (CPD). Use of the PRAT has tightened up departmental processes for ensuring informed consent forms are in patient files. It is unlikely the very high rate currently reported will change in the years to come.

The trend for clinical trial participation continues to demonstrate falling participation rates, although the reported rate from 2013 was higher than 2012 (**CI 1.3**). It can be difficult to collect clinical trial data and the records submitted may not reflect true numbers of patients enrolled. In addition, clinical trials do not include all clinical research, such as health services research and quality-focused research (which may result in far greater outcome gains than 'clinical trials' per se). Thus, this CI does not capture all patients enrolled in relevant research.

Variations in the collected data will occur based on the number of trials staff and economies of scale in large academic centres as opposed to smaller rural centres. Not surprisingly,

there is variation, as recruitment to trials is directly related to trials support. FACRO and the RANZCR previously predicted these figures would worsen (as the data show in the current report), and will potentially worsen in future years as funding for trials staff continues to be reduced across some states.

Treatment process

There is little difference in the results for **CI 2.1** in 2013 compared to 2012. There are a number of potential reasons for this. Only seven HCOs have elected to submit data for **CI 2.1** in 2013, and they represent only 45 patients receiving post-operative radiotherapy for SCC of the oral cavity, pharynx, hypopharynx or larynx. Cancer subtype data can be difficult to collect, particularly in centres without electronic oncology records, and this may in part contribute to the low number of patients included in 2013. These small numbers make statistical comparisons difficult and unreliable.



There are a number of reasons why waiting times may be prolonged. Radiotherapy is complex for these tumour sites, with the standard use of image guided intensity modulated radiation therapy (IG IMRT). Patient management takes up a lot of specialist, planning and physics QA time, which contributes to wait times. Generic radiotherapy waiting lists can also contribute to post-operative delays, and the misinterpretation of 'ready for care' dates may also have an unknown impact. One other reason for long delays is a deficiency of allied health support (e.g. dieticians, physiotherapists, speech pathologists, dentists) resulting in prolonged recovery times post-surgery. Allied health staff numbers are not keeping pace with the increased incidence of cancer in Australia.

Some HCOs may refer complex cases to larger centres, but this does not explain why many sites do not contribute these data.

Only eight (8) HCOs submitted data for **CI 2.2**, in 2013 the denominator represented only 70 cervical cancer patients receiving curative radiotherapy or chemoradiotherapy. Of these, 85.7% received a combination of chemo – and radiotherapy, with the goal of a cure.

Over time the fitted rate data have improved due to acceptance of the superiority of chemoradiotherapy over radiotherapy alone. The rate can never reach 100%, as some patients will choose not to have chemotherapy or will be ineligible due to age or co-morbidity. Some sites may refer complex cases to larger centres, but this does not explain why only eight (8) sites contribute to **CI 2.2** data. Cancer subtype data can be difficult to collect, particularly in centres without electronic oncology records.

Between 2007 and 2013, the proportion of patients receiving megavoltage radiotherapy with a MLC (**CI 2.3**) has risen, and is now at 91.2%. Even among outlier HCOs, 82.1% of megavoltage radiotherapy courses involved an MLC in 2013. MLCs enable shielding of critical organs and reduce radiotherapy side-effects, however they are only available on newer linear accelerators. Over time the rate has increased as new machines replace older machines, and radiotherapy techniques evolve to 3D conformal radiotherapy and IMRT even for palliative patients. However, the rate will never be 100% as not all patients require treatment with an MLC.

Twelve HCOs provided data for **CI 2.4**, reporting on 7590 patients receiving courses of curative megavoltage radiotherapy in 2013. Among this group of HCOs, use of CT planning (**CI 2.4**) was 99.3%. CT planning allows for better delineation of cancer targets and critical normal structures, and is used for most patients treated with radiotherapy. Although CT planning is optimal for most patients, some can be treated very well without CT. For this reason the rate may never reach 100%.

At eleven participating HCOs, 95.5% of radiotherapy patients have communication on file that includes a letter to the referring doctor and/or to the GP (**CI 2.5**). A single outlier had a record of 82.6%. These data can be difficult to collect particularly in centres without electronic oncology records, and this may account for outliers. In addition, departments with high inpatient loads may have this information in different electronic systems (which do not communicate with the oncology EMR), and thus the letters are not identified. The results for this CI have improved over time, which may partly be due to the inclusion of the item in the RANZCR Peer Review Audit Tool used by RANZCR radiation oncologists to gain

CPD points. The other reason for the improvement may be the increased uptake of electronic oncology records which allow for improved data collection.

Outcome process

Seven HCOs in 2013 reported on 73 patients with glottic cancer (T1–2N0M0) (**CI 3.1**). Among these patients, 84.9% had a complete follow-up. Smaller centres may refer complex head and neck patients to larger sites, and this may, in part, contribute to the low number of centres participating. Data including cancer subtypes may also be difficult to collect without electronic oncology records. However, even with electronic records, endpoints such as subsequent laryngectomy rates may be very difficult to collect.

Complete follow-up does not necessarily require ongoing radiation oncology follow-up. For head and neck cancers, an ear, nose and throat (ENT) surgeon could do the follow-up as effectively as a radiation oncologist. This may reflect the fact that not 100% of patients have a complete follow-up. If other doctors perform follow-up then data related to follow-up status may not be in the radiation oncology department's records. There are many remote cancer patients who will undergo all follow-up with their local GP. One other reason is that head and neck patients, in particular, often have multiple social issues, can be transient, and can be from minority groups. This can lead to them being more frequently lost to follow-up. A final reason contributing to incomplete follow-up is the fact that there is very little evidence to support what constitutes optimal follow-up, and if clinicians do not agree with the definition in this CI, they are less likely to comply with the complete follow-up of patients as defined by this report.



Only a limited number of HCOs chose to submit **CI 3.2** in 2013, despite there being significant numbers of patients receiving radiotherapy for breast conservation (pT1-3, any nodal staging, M0). Data can be difficult to collect without electronic oncology records, however the improvement in the fitted rate over time may reflect the increased uptake of electronic records. Yet even with electronic records, subsequent mastectomy rates may be difficult to collect. Complete follow-up does not necessarily require ongoing radiation oncology follow-up, and breast surgeons and GPs can perform follow-up as well as radiation oncologists. If other doctors perform follow-up, then data related to follow-up status may not be in the radiation oncology department's records. There are many remote breast cancer patients who will undergo all follow-up with their local GP. For this reason the CI will never reach 100%. A final reason contributing to incomplete follow-up is the fact that there is very little evidence to support what constitutes optimal follow-up, and if clinicians do not agree with the definition in this CI, they are less likely to comply with or collect data for the complete follow-up of patients as defined by this report.

General comments

Given that many of the CI rates appear to have plateaued, it is possible that a review of radiation oncology CIs is warranted, including reviewing the evidence behind chosen CIs, optimal CI rates, and how to use CIs to change practice (translational research).

Response rates

In general denominator sizes seem low, making interpretation of CI rates difficult. There may be a number of contributors to the low rates, many previously outlined. In the absence of electronic records, collecting the required data can be extremely time consuming and may affect participation. Centres without electronic oncology records are unable to monitor and update their own data in a timely manner, compounding the problem.

There is little evidence to support the importance and definitions of many of the CIs. It is possible some specialists do not agree with the definitions of some CIs, or the importance of them. These issues may impact on centre participation.

The roll-out of integrated oncology records shared by radiation and medical oncology should be undertaken across Australia. Participation in the collection of these data by public and private centres could then be made mandatory by the various jurisdictions. The RANZCR should also mandate that all radiation oncologists must use the Peer Review Audit Tool in order to comply with CPD requirements.

Several endpoints which occur subsequent to the original diagnosis and treatment (e.g. subsequent mastectomy and laryngectomy rates) will often never be recorded for reasons previously specified, thus making these data points difficult to collect.

There are no estimates given of 'optimal' rates for each CI, and indeed there is little evidence to support what rates should be. 'Optimal' rates for the various CIs should be considered and published, where evidence exists. Clinical trial and allied health staff numbers should be appropriately funded by the states and territories.

Quality improvement

It is difficult to recommend how these data should be utilised by individual centres and specialists. There is little evidence to support the importance and definitions of many of the CIs. It is possible some specialists do not agree with the definitions of some CIs, or the importance of them. There are significant flaws in data collection and interpretation for the reasons previously mentioned, with true CI rates unknown due to often limited participation. It is possible that many of the CIs are already at 'optimal' rates, hence there is no value in educating centres or specialists further and there could be an argument to omit some of the current CIs in the future. It is also true that many of the CIs are measuring endpoints of obvious importance, and that centres already try to comply. Where rates are poor, issues beyond the control of individual centres (such as poor staffing or lack of EMR) may not be impacted by the publication of these CIs. It is also possible that feeding back rates to individual centres may cause poorly performing centres to do better.



Radiology

VERSION 4

Report availability

CI 1.1 Radiographic reports – unavailable within 24 hours (L) In 2013, there were 95,963 requests reported from 54 HCOs. The annual rate was 23.7 per 100 requests. The fitted rate improved from 37.8 to 17.6, a change of 20.2 per 100 requests. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 20.5 per 100 requests. In 2013, the potential gains totalled 17,839 fewer reports not available within 24 hours, corresponding to a reduction by approximately three-quarters. There were 29 outlier records from 19 HCOs whose combined excess was 6,867 more reports not available within 24 hours. The outlier HCO rate was 45.6 per 100 requests.

Morbidity of radiological procedures

CI 2.1 Percutaneous trans-pleural biopsy – pneumothorax or haemothorax (L) In 2013, there were 1,659 patients reported from 37 HCOs. The annual rate was 8.1 per 100 patients. The fitted rate deteriorated from 7.0 to 9.3, a change of 2.3 per 100 patients. The potential gains totalled 45 fewer patients who have pneumothorax and/or haemothorax requiring intervention, corresponding to a reduction by approximately one-quarter. There were two outlier records from two HCOs whose combined excess was 11 more patients who had pneumothorax and/or haemothorax requiring intervention. The outlier HCO rate was 38.5 per 100 patients.

CI 2.2 Limb angioplasty – peripheral embolic complications (L) In 2013, there were 1,903 angioplasties reported from 17 HCOs. The annual rate was 1.00 per 100 angioplasties. The fitted rate improved from 1.5 to 0.83, a change of 0.65 per 100 angioplasties. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.70 per 100 angioplasties. In 2013, the potential gains totalled seven fewer peripheral embolic complications of limb arteries, corresponding to a reduction by approximately one-third.

CI 2.3 CT procedure – iodinated contrast extravasation (L)

In 2013, there were 211,341 patients reported from 50 HCOs. The annual rate was 0.29 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 216 fewer patients experiencing iodinated contrast extravasation requiring medical review, corresponding to a reduction by approximately one-third. There were five outlier records from four HCOs whose combined excess was 60 more patients experiencing iodinated contrast extravasation requiring medical review. The outlier HCO rate was 0.67 per 100 patients.

CI 2.4 Puncture site complications during or following angiography (L)

In 2013, there were 12,320 angiograms reported from 24 HCOs. The annual rate was 0.92 per 100 angiograms. The fitted rate improved from 2.9 to 0.69, a change of 2.2 per 100 angiograms. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.4 per 100 angiograms. In 2013, the potential gains totalled 73 fewer puncture site complications, corresponding to a reduction by approximately one-half. There were six outlier records from six HCOs whose combined excess was 45 more puncture site complications. The outlier HCO rate was 4.3 per 100 angiograms.



Expert Commentary

Royal Australian and New Zealand College of Radiologists (RANZCR)

Introductory comments

RANZCR is pleased to be able to provide comment on the Australasian Clinical Indicator Report 2006–2013. The College strongly recommends that further work be conducted to define data collection parameters to improve consistency of data gathering and capacity to interpret and act upon future reports. The College remains available to review and provide input and recommendations into a more balanced suite of CIs that it is hoped will over time reflect all dimensions of quality in a manner appropriate to radiology.

Report availability

The rate for **CI 1.1** has increased from 22.2% in 2012 to 23.7% in 2013. In 2013, five less HCOs reported on **CI 1.1** than in 2012, however the denominator, which records reports on radiographic examinations, is the lowest it has been since 2006 (108,923 in 2012, peak 578,150 in 2006).

Among 54 HCOs submitting data in 2013, one in every four of their requests for radiographic reports is not available within 24 hours. There is enormous variation in this rate. The trend plot remains promising.

The best performing 20% HCO rate is 5.10% and the poorest performing 20% HCO rate is 40.6%, resulting in centile gains of 17,839 reports. There were stratum gains of 6,117 reports, and outlier gains of 6,867 reports. The Victorian HCO rate is again the lowest at 16.4% and the NSW HCO rate is the highest at 34.6%. There were 29 outlier records from 19 HCOs responsible for an outlier HCO rate of 45.6 per 100 requests.

RANZCR notes that the decreased rate is encouraging and may reflect improved staffing or extension of reporting hours at various sites resulting in quicker reporting, increased utilisation of voice recognition technology and/or variation in the method used by sites when collecting data. It is quite possible that sites may be using different definitions for 'radiographic examinations', leading to variations in the rate across time.

To analyse the results, it would be helpful if ACHS provided more specific instructions to HCOs in order to clarify the types of examinations that are being captured (e.g. all ED or all inpatient studies). Without such information, the clinical significance of these results is unclear due to possible disparity between sites with regard to whether these data reflect different proportions of inpatient, ED, and outpatient examinations. RANZCR notes that this CI is not usefully applied to outpatient services; it is similarly lacking in purpose if it is measuring a mix of inpatient and outpatient examinations without stratification.

In observing the lowest denominator in the past eight years, the College suggests that this may be attributable to some HCOs leaving the pool and others entering it. Alternatively, it may be explained by variations in data collection, with various HCOs observing different definitions for gathering information (e.g. being more selective in reporting inpatient or outpatient cases only). This CI is sensitive to whether trainee reports are checked at a given site (reduces performance) as well as the number of hours that a reporting service is offered at given sites, extended reporting hours being strongly associated with better performance.

Morbidity of radiological procedures

The rate for **CI 2.1** has increased from 8.04% in 2012 to 8.14% in 2013, with three less HCOs reporting on this CI. This reported rate is in the acceptable range.

The rates for patients requiring intervention for pneumo – and/or haemothorax following a transpleural biopsy has fluctuated around eight per 100 patients for the past eight years. At the poorest centile HCOs, almost one in every five patients will require intervention for pneumo – or haemothorax following a transpleural biopsy. If all HCOs were to achieve the rates reported by the top centile of HCOs, it is estimated that around one in every three of those interventions for pneumo – or haemothorax would not be needed.

The best performing 20% HCO rate is 5.44% and the poorest performing 20% HCO rate is 15.2%, resulting in centile gains of 45. There were two outlier HCOs responsible for an outlier HCO rate of 38.5 per 100 patients.

The CI rate remains essentially stable. RANZCR notes that definitions provided now refer to the first post-procedural chest x-ray and this removes previous ambiguity regarding CT. The latter is considerably more sensitive in detecting such complications and in the past may have contributed to some variation in the data from sites. The definition of intervention remains unclear (e.g. aspiration, fine calibre pleural catheter placement or introduction of a large bore chest drainage tube). The nature of intervention (any versus specific types) could be defined to provide consistency of the data and more meaningful interpretation. In this setting other sources of variation such as differences in patient population (e.g. COAD prevalence) at various sites could be considered.



The rate for **CI 2.2** has fluctuated since 2006, and is currently 1.00% in 2013 as opposed to 1.08% in 2012. A total of 17 HCOs reported on this CI in 2013, and centile gains were 7 angioplasty patients. The fluctuation in rate is relatively minor, but may be related to issues regarding definition used by each HCO to report a peripheral complication and what the instructions are for participating sites whilst capturing this data.

The mean rate of peripheral embolic complications during limb angioplasty among the 17 reporting HCOs is 1.00, and reflects an initial improvement in the fitted rate which has stabilised from 2008 onwards. Most of the variation came from two records submitted by different HCOs.

RANZCR notes that this may be explained by variation in data from the various HCOs, particularly if the data are captured from a range of different disciplines (e.g. vascular surgeons / physicians, cardiologists, interventional nephrologists) which may be performing these procedures across sites and HCOs. A further explanation may be that case-mix varies across the reporting sites and HCOs, e.g. older patient cohorts with existing co-morbidities, can account for the differences in complication rates, as they are at higher risk.

It is observed that whilst the rate has fluctuated across time, it has remained relatively low, and is within an acceptable range.

The rate for **CI 2.3** has remained constant across the last eight years (0.25–0.31%) and is currently 0.29%. Two less HCOs (total 50 in 2013, 52 in 2012) are now reporting on this CI. This reported rate is in the acceptable range.

The best performing 20% HCO rate is 0.19% and the poorest performing 20% HCO rate is 0.41%. There were five outlier HCOs responsible for an outlier HCO rate of 0.67 per 100 patients. Fifty HCOs submitted data in 2013 reporting on over 200,000 IV contrast enhanced CT scans. The rate of contrast extravasation per 100 patients was 0.29, and this has been steady during the previous eight years of collection. If the five HCOs that submitted an outlier record during 2012 had achieved the mean rate across the group, 60 patients would not have had to deal with iodinated contrast extravasation.

RANZCR notes that the rates have remained stable, and lie within expected values. The reason for the difference between the best performing centile rate of 0.19% and the poorest performing centile rate of 0.41% is difficult to confidently identify. It is possible that some HCO sites may have better reporting mechanisms and record such contrast extravasation incidents more effectively. Alternatively, some sites may perform a higher proportion of CT angiography examinations contributing to higher injection pressures and higher complication rates. HCOs and sites may also migrate in and out of the data collection.

The rate for **CI 2.4** has fluctuated since 2006, and is currently 0.92% in 2013 as opposed to 0.83% in 2011. The denominator has decreased from 12,612 in 2012 to 12,320 in 2013. A total of 24 HCOs reported on this CI in 2013 and the outlier HCO rate in 2013 (4.3 per 100 angiograms) has decreased since 2012 (6.2 per 100 angiograms) and is lower compared to 2011 (4.4 per 100 angiograms). Fluctuation in the rate is relatively minor but may be related to issues regarding definition (e.g. clinical diagnosis of puncture site haematoma vs usual minor leakage is imprecise). Such variation may be accounted for by variable use of anti-coagulants and inclusion of data from services provided by cardiologists or vascular surgeons within radiology departments or elsewhere within HCOs. These results may reflect the different techniques used by different craft groups, including use of closure devices versus manual compression, ultrasound guided puncture, etc. The variations may also reflect different case-mix across various HCOs.

The mean for this CI has fluctuated around 2 puncture site complications per 100 angiograms in the years since 2006. There has been a steady (and statistically significant) improvement in these data in recent years. Despite this there is potential for improvement, with six outlier records. If all HCOs could achieve the rates of the top centile, the number of puncture site complications could potentially be halved.

General comments

The information and trends from the CIs may assist HCOs to benchmark the performance of individual sites in terms of some key safety factors within diagnostic imaging scenarios in Australia.



Expert Commentary

Medical Imaging Nurses Association (MINA)

Report availability

The statistical data of **CI 1.1** continue to indicate a significant improvement from previous years. This improvement could be resulting from the wider use of electronic reporting, especially in the rural areas.

The breakdown of statistics by state, and private vs public sector, is not included in the printed statistical data supplied. The changes to the future CIs may well provide more relevant data related to reporting of medical imaging studies.

Morbidity of radiological procedures

The trends of **CI 2.1** appear to be stable with no major changes. The two outlier HCOs still had 11 episodes of pneumothorax and/or haemothorax requiring intervention, down from 21 in 2012. The outlier rate of 38.5 per 100 patients is high, but in the larger picture 8.1 per 100 patients overall.

Influencing factors could include patient condition and compliance throughout the biopsy. Size of lesion being biopsied, size of biopsy needle, experience of the clinician performing the biopsy could affect the outcome.

The statistics of **CI 2.1** display a continuing small downward trend. The composition of HCOs for 2013 changed with NSW producing few complications compared to the 11 other HCOs presenting their CIs. Noted there was no outlier HCOs. Rate for 2012 was 1.08 per 100 reducing to 1.0 per 100 in 2013. Factors affecting the rate of embolic complications would include the co-morbidities of the patient undergoing limb angioplasty and compliance of patients post-procedure.

The rate of **CI 2.3** remains stable at 0.29 per 100 patients, although the outlier HCO rate increased to 60 from 48 in 2012. The accuracy of these statistics is dependent on the HCOs capturing all contrast extravasations that require a medical review plus or minus intervention. Ideally the HCO should be capturing all extravasations through their adverse events system.

Contributing factors to extravasation could include the cannulation site, type and length of cannula, length of time the cannula has been in-situ, level of difficulty in cannula insertion, experience of clinician inserting the cannula or the intraluminal tip displacement on repositioning the patient's arm for CT power injection.

The rate of **CI 2.4** remains relatively stable with the aggregate rate 0.92 per 100 angiograms and the fitted rate 0.69 per 100 angiograms. The outlier complication rates have increased from 31 to 45 from 6 outlier HCOs. In the report supplied there is not breakdown by state or the HCOs supplying data as there were 2 fewer HCOs reporting 8 more complications (4.3 per 100 angiograms) on approximately 300 fewer procedures performed.

The complication may be affected by the method for closure of the puncture site as new techniques and devices are introduced onto the market, the patient's co-morbidities and compliance post-angiogram.

General comments

The statistical data from the five Radiology CIs remain relatively stable and in low range. The data remain generic with comment drawing on the supplied data graphs and tables. Information on the HCOs, including metropolitan vs rural and private vs public sector could provide more information, although anonymity remains paramount. The important factor is that each HCO receives its own data and is able to benchmark its results against other HCOs with anonymity maintained. Definitions and methodology for data collection of the CIs may be subject to interpretation by the HCO.

MINA takes this opportunity to thank ACHS for the opportunity to review and make comment on the Radiology CIs.





Rehabilitation Medicine

VERSION 5

Timely assessment of function on admission

CI 1.1 Functional assessment within 72 hours of admission (H) In 2013, there were 57,148 patients reported from 111 HCOs. The annual rate was 96.9 per 100 patients. The fitted rate improved from 94.9 to 97.1, a change of 2.3 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.2 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were 36 outlier records from 29 HCOs whose combined excess was 934 fewer patients for whom there was documented evidence of a functional assessment within 72 hours. The outlier HCO rate was 86.2 per 100 patients.

Assessment of function prior to episode end

CI 2.1 Functional assessment within 72 hours before end of rehabilitation (H) In 2013, there were 52,921 inpatients reported from 109 HCOs. The annual rate was 98.1 per 100 inpatients. The fitted rate improved from 94.4 to 98.0, a change of 3.7 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 3.6 per 100 inpatients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were 27 outlier records from 23 HCOs whose combined excess was 446 fewer inpatients for whom there was documented evidence of a functional assessment within 72 hours of cessation of the rehabilitation program. The outlier HCO rate was 88.9 per 100 inpatients.

Timely establishment of a multi-disciplinary rehabilitation plan

CI 3.1 Timely establishment of a multidisciplinary team rehabilitation plan (H) In 2013, there were 53,487 patients reported from 114 HCOs. The annual rate was 98.1 per 100 patients. The fitted rate deteriorated from 97.8 to 97.5, a change of 0.28 per 100 patients. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were 39 outlier records from 27 HCOs whose combined excess was 638 fewer patients for whom there was a documented established multidisciplinary rehabilitation plan within 7 days of patient admission. The outlier HCO rate was 90.0 per 100 patients.

Multidisciplinary discharge documentation

CI 4.1 Discharge plan on separation (H) In 2013, there were 53,749 separations reported from 112 HCOs. The annual rate was 96.9 per 100 separations. The fitted rate deteriorated from 98.3 to 97.5, a change of 0.83 per 100 separations. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were 24 outlier records from 19 HCOs whose combined excess was 1,184 fewer separations for which there was an appropriate discharge plan. The outlier HCO rate was 77.0 per 100 separations.

Functional gain achieved by rehabilitation program

CI 5.1 Functional gain following completed rehabilitation program (H) In 2013, there were 55,101 patients reported from 113 HCOs. The annual rate was 95.2 per 100 patients. There was no significant trend in the fitted rate. There was relatively little variation between HCOs and so the potential gains were small in 2013. There were 45 outlier records from 34 HCOs whose combined excess was 825 fewer patients discharged for whom there was documented evidence of functional gain. The outlier HCO rate was 87.7 per 100 patients.

Discharge destination

CI 6.1 Destination after discharge from a rehabilitation program (H) In 2013, there were 50,003 patients reported from 107 HCOs. The annual rate was 87.4 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 4,132 more patients discharged to their pre-episode form of accommodation, or a form of accommodation that allowed for greater independence. There were 54 outlier records from 41 HCOs whose combined excess was 1,965 fewer patients discharged to their pre-episode form of accommodation, or a form of accommodation that allowed for greater independence. The outlier HCO rate was 70.7 per 100 patients.



Expert Commentary

Royal Australasian College of Physicians – Australasian Faculty of Rehabilitation Medicine (AFRM)

The Australasian Faculty of Rehabilitation Medicine (AFRM) and the Australasian Rehabilitation Outcomes Centre (AROC) are proud of the continued high standard of compliance with the ACHS CIs by all participating HCOs. AFRM has included the ACHS CIs in the AROC dataset to encourage HCOs to participate in this important collection and thereby promote continued improvement in these processes and outcomes.

No additional comment is required for any CI other than **CI 6.1**. Clinically it is not uncommon for a patient to temporarily require additional assistance following a rehabilitation episode. This may include discharge to other than usual accommodation i.e. interim accommodation. Therefore, the rate for this CI which measures return to pre-episode accommodation or new accommodation allowing for greater independence is consistent with expectations. This outcome-based CI should continue to trend at its current rate.

The quality of data collected is of a high standard, with well-established, nationally consistent education programs in situ. On that basis, AFRM and AROC are confident about the results reported here.

HCOs are encouraged to continue reviewing their CI collections to help inform processes and practices in order to maintain the high rates achieved in previous years.



Surgery

VERSION 3

Paediatric surgery

CI 1.1 Pyloromyotomy – mucosal perforation (L) In 2013, there were 65 patients reported from five HCOs. The annual rate was 0 per 100 patients. There was no significant trend in the fitted rate. There were no potential gains in 2013.

CI 1.2 Paediatric appendicectomy – normal histology (L) In 2013, there were 1,170 appendicectomies reported from 21 HCOs. The annual rate was 15.6 per 100 appendicectomies. The fitted rate deteriorated from 14.1 to 16.2, a change of 2.1 per 100 appendicectomies. There was relatively little variation between HCOs and so the potential gains were small in 2013.

CI 1.3 Paediatric appendicectomy – normal histology but other pathology (L) In 2013, there were 971 appendicectomies reported from 19 HCOs. The annual rate was 6.2 per 100 appendicectomies. There was no significant trend in the fitted rate. The potential gains totalled 28 fewer children undergoing appendicectomy with normal histology, but significant other intra-abdominal pathology, corresponding to a reduction by approximately one-third.

Urology

CI 2.1 TUR for benign prostatomegaly – average operating time (N) In 2013, there were 598 patients reported from 13 HCOs. The average operating time per patient was 52.9 minutes. There was no significant trend in the fitted rate.

CI 2.2 TUR for benign prostatomegaly – average LOS (N) In 2013, there were 819 patients reported from 18 HCOs. The average length of stay was 2.8 days.

CI 2.3 TUR for benign prostatomegaly – average weight of tissue (N) In 2013, there were 413 patients reported from nine HCOs. The average weight of tissue was 21 grams.

CI 2.4 TUR for benign prostatomegaly – blood transfusion (L) In 2013, there were 2,756 patients reported from 51 HCOs. The annual rate was 2.2 per 100 patients. The fitted rate improved from 3.4 to 2.9, a change of 0.57 per 100 patients. The potential gains totalled 28 fewer patients having a TUR for benign prostatomegaly who had a blood transfusion, corresponding to a reduction by approximately one-third. There was one outlier record from one HCO whose combined excess was five more patients having a TUR for benign prostatomegaly who had a blood transfusion. The outlier HCO rate was 8.0 per 100 patients.

CI 2.5 TUR for benign prostatomegaly – unplanned readmission within 28 days (L) In 2013, there were 2,057 patients reported from 29 HCOs. The annual rate was 5.1 per 100 patients. The fitted rate deteriorated from 4.0 to 5.8, a change of 1.8 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.8 per 100 patients. In 2013, the potential gains totalled 21 fewer patients having an unplanned readmission within 28 days, corresponding to a reduction by approximately one-fifth.

Orthopaedic surgery

CI 3.1 Orthopaedic surgery – THJR patients having a post-operative in-hospital infection (L) In 2013, there were 3,244 patients reported from 38 HCOs. The annual rate was 0.49 per 100 patients. There was no significant trend in the fitted rate. There was relatively little variation between HCOs and so the potential gains were small in 2013.

Plastic surgery

CI 4.1 Plastic surgery – completely excised malignant skin tumours (H) In 2013, there were 6,996 excisions reported from 22 HCOs. The annual rate was 90.4 per 100 excisions. There was no significant trend in the fitted rate. The potential gains totalled 360 more completely excised malignant skin tumours. There were three outlier records from three HCOs whose combined excess was 132 fewer completely excised malignant skin tumours. The outlier HCO rate was 75.3 per 100 excisions.

Cardiothoracic surgery

CI 5.1 Cardiothoracic surgery – deaths in the same admission as having CAGS (L) In 2013, there were 6,200 patients reported from 29 HCOs. The annual rate was 1.3 per 100 patients. The fitted rate improved from 1.9 to 1.4, a change of 0.46 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.46 per 100 patients. In 2013, the potential gains totalled 10 fewer patients who died in the same admission as having CAGS, corresponding to a reduction by approximately one-tenth.

CI 5.2 Cardiothoracic surgery – deaths in the same admission as having elective CAGS (L) In 2013, there were 2,655 patients reported from 17 HCOs. The annual rate was 1.4 per 100 patients. There was no significant trend in the fitted rate. There were no potential gains in 2013.



CI 5.3 Coronary artery graft surgery patients aged less than or equal to 71 years – death (L) In 2013, there were 1,904 patients reported from 21 HCOs. The annual rate was 2.3 per 100 patients. There was no significant trend in the fitted rate. There were no potential gains in 2013.

Neurosurgery

CI 6.1 Neurosurgery – patients having a neurosurgical infection (L) In 2013, there were 7,795 patients reported from 11 HCOs. The annual rate was 1.2 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 21 fewer patients having a neurosurgical infection in hospital, corresponding to a reduction by approximately one-fifth.

CI 6.2 Neurosurgery – new neurological deficit following a neurosurgical procedure (L) In 2013, there were 8,265 patients reported from 12 HCOs. The annual rate was 1.3 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 45 fewer patients with a new neurological deficit following neurosurgery, corresponding to a reduction by approximately one-third. There was one outlier record from one HCO whose combined excess was nine more patients with a new neurological deficit following neurosurgery. The outlier HCO rate was 4.8 per 100 patients.

General surgery

CI 7.1 Laparoscopic cholecystectomy – operative intervention for bile duct injury (L) In 2013, there were 13,860 patients reported from 79 HCOs. The annual rate was 0.34 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled 23 fewer patients having a bile duct injury requiring operative intervention, corresponding to a reduction by approximately one-third. There were two outlier records from two HCOs whose combined excess was four more patients having a bile duct injury requiring operative intervention. The outlier HCO rate was 2.4 per 100 patients.

Vascular surgery

CI 8.1 Elective AAA – death (L) In 2013, there were 342 patients reported from 17 HCOs. The annual rate was 1.8 per 100 patients. There was no significant trend in the fitted rate. There were no potential gains in 2013. There were two outlier records from one HCO whose combined excess was three more patients having an elective AAA repair who died. The outlier HCO rate was 0.93 per 100 patients.

CI 8.2 Carotid endarterectomy – stroke (L) In 2013, there were 552 patients reported from 16 HCOs. The annual rate was 2.2 per 100 patients. There was no significant trend in the fitted rate. The potential gains totalled eight fewer patients having a carotid endarterectomy who had a stroke, corresponding to a reduction by approximately one-half.

Otolaryngology

CI 9.1 Tonsillectomy – significant reactionary haemorrhage (L) In 2013, there were 13,474 patients reported from 64 HCOs. The annual rate was 0.43 per 100 patients. The fitted rate improved from 0.69 to 0.45, a change of 0.24 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.24 per 100 patients. In 2013, the potential gains totalled 11 fewer patients who had a significant reactionary haemorrhage following tonsillectomy, corresponding to a reduction by approximately one-tenth.

Abbreviations

Abbreviations

ACE Inhibitor	ACEI	Haemoglobin	Hb
Angiotensin II receptor antagonist	A2RA	Healthcare organisation	HCO
Abdominal aortic aneurysm	AAA	Hospital in the home	HITH
Acute coronary syndrome	ACS	Intensive care unit	ICU
The Australian Commission on Safety and Quality in Health Care	ACSQHC	Intensity-modulated radiation therapy	IMRT
Atrial fibrillation	AF	Lower segment caesarean sections	LSCS
Acute myocardial infarction	AMI	Multileaf collimator	MLC
Australian and New Zealand College of Anaesthetists	ANZCA	Methicillin-resistant staphylococcus aureus	MRSA
Australasian triage scale	ATS	Neonatal intensive care unit	NICU
Bloodstream infections	BSI	Percutaneous coronary intervention	PCI
Blood sugar level	BSL	Post discharge	PD
Coronary artery bypass graft	CABG	Peripherally-inserted central line-associated bloodstream infection	PI-CLABSI
Congestive heart failure	CHF	Post-operative nausea and vomiting	PONV
Clinical Indicator	CI	Peer review audit tool	PRAT
Centrally-inserted central line-associated blood stream infection	CI-CLABSI	Percutaneous transluminal coronary angioplasty	PTCA
Central line-associated bloodstream infection	CLABSI	Red blood cell	RBC
Central line-utilisation ratios	CLUR	Residential care facility	RCF
Chronic obstructive pulmonary disease	COPD	Registered nurse	RN
Continuous professional development	CPD	Surgical site infection	SSI
Emergency department	ED	Turnaround times	TATs
Healthcare-associated infection	HAIs	Vaginal birth after caesarean section	VBAC
		Venous thromboembolism	VTE

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