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Clinical indicators in accreditation: an effective stimulus to improve patient care

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Abstract

The Australian Council on Healthcare Standards (ACHS) established the Care Evaluation Program (CEP) of clinical performance measures in its accreditation program to increase the clinical component of that program and to increase medical practitioner involvement in formal quality activities in their health care organizations. From the introduction of a set of generic indicators in 1993 the program expanded through all of the various medical disciplines and from January 2000 there will be 18 sets (well over 200 indicators) in the program. More than half of Australia's acute hospitals (covering the majority of patient separations) are monitoring the indicators and reporting clinical data twice yearly to the ACHS. In turn they receive a 6-monthly feedback of aggregate and peer comparative results. The ACHS policy had no specific requirement for a set number of indicators to be monitored and it was not mandatory to achieve any specific data threshold to be accredited. However, where an organization's results differed unfavorably from those of its peers some action was expected. Qualitative information is also sent to the CEP and this has enabled a determination of the effectiveness of the indicators. There is documented evidence of improved management and numerous examples of improved patient outcomes. The program remains unique in the scope of the medical disciplines covered and in the formal provider involvement with indicator development. Both the clinical component of accreditation and clinician involvement in quality activities have been increased in an educational process. However, not all of the indicators are of equal value and a reduction in the number of indicators to a 'core' group of the most reliable and responsive ones is in process.

Keywords: accreditation, clinical data, clinical indicators, clinical performance measurement

The purpose of a hospital is to provide the optimum environment for the treatment of compromised people and accreditation programs attempt to ensure that 'environment' by addressing the structure and organizational processes, staff qualifications, equipment, fire safety, infection control etc. It is appropriate to expect that if the 'environment' is ordered and safe, then patient outcomes are more likely to be the desirable ones. In the case of the Australian Council on Healthcare Standards (ACHS) accreditation process, assessment of actual patient care and outcomes was left to the health care professionals through their own quality activities. The existence of a formal quality activities program in a health care organization was a mandatory standard. Unfortunately, in the mid 1980s, a minority of hospitals had a satisfactory quality assurance program [1]. This was due mainly to a limitation of medical practitioner involvement. Also in the opinion of many clinicians (expressed to the author) the accreditation process, at that time, was contributing little to the improvement in patient care.

Thus at the end of 1989, to increase clinician involvement in formal quality programs and to increase the clinical component of the accreditation process, the ACHS obtained the support of the Committee of Presidents of the Medical Colleges for the joint development of clinical performance measures that could be introduced into the accreditation process. Federal funding, with additional support from a pharmaceutical company, enabled the establishment of the Care Evaluation Program (CEP) for the introduction of performance measures, which would be known as clinical indicators.

Indicator development

A clinical indicator was defined simply as a measure of the clinical management and/or outcome of care. Over the next 10 years 18 sets of clinical indicators were developed, commencing with a 'hospital wide' set, extending to all of the main clinical specialties and finishing with a set of indicators for 'Hospital in the Home' care. Table 1 lists the indicator sets and their year of introduction into accreditation. For each indicator set the process involved a literature search, the drafting of indicators by a college/CEP working party, field testing, refinement, confirmation by a college council

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Table 1 List of the ACHS accreditation program's clinical indicator sets, the years in which they were introduced and the number of indicators in each set

Year	Clinical indicator set	Number of indicators
1993	Hospital wide medical indicators	10
1995	Obstetrics and gynecology	20
1996	Anesthesia	9
	Day procedures	5
	Emergency medicine	5
	Internal medicine	35
	Psychiatry	29
1997	Ophthalmology	9
	Pediatrics	8
	Radiology	6
	Rehabilitation medicine	7
	Surgery	53
1998	Intensive care	5
	Dermatology	19
	Pathology	11
1999	Radiation oncology	4
	Adverse drug reactions	6
2000[1]	Hospital in the home	8

[1]For introduction January 2000.

and subsequent publication and promotion. Only three basic principles were established for initial indicator development. The area was to be of clinical importance, i.e. a commonly treated serious illness or a major complication of a commonly performed operation; the data should be available within the health care organization; and the indicator should be acceptable to the providers whose practice was to be assessed. It was also determined that any quantitative measure established should be achievable. The field-testing determined data availability and the usefulness of the indicators from the provider's point of view. The development time frame for a set varied from 2 to 4 years depending upon the number of indicators and various subspecialties involved. The vast majority of the indicators were rate based e.g. infection rates, with a small number being sentinel events e.g. the prescription of a drug for which an 'alert notice' existed.

Procedural groups such as surgeons preferred to establish outcome indicators e.g. the breakdown rate for a bowel anastomosis. The cognitive specialties, such as internal medicine, preferred process measures e.g. the time taken for administration of a thrombolytic agent for an acute myocardial infarction.

Indicator role in accreditation

The first indicator set, the Hospital Wide Medical Indicators, was a set of generic measures developed with the Royal Australasian College of Medical Administrators and introduced into the accreditation program in 1993. Under ACHS policy, a health care organization that had contracted with the ACHS was expected to address this set of indicators and to provide the data that resulted from their monitoring to the CEP and the surveyors in the year of their survey. There was no requirement to address a set number of indicators, and compliance with any particular rate or 'threshold' was not mandatory. No patient or provider information was requested or provided to the CEP. The CEP established a nationwide data base (built in Paradox software with an automatic reporting ability) and provided feedback to each health care organization on the aggregate results for the indicator and also a comparison with a peer group of hospitals. The health care organization was expected to take appropriate action if its results compared unfavorably with those of the peer group.

From 1997, with the introduction of a revised accreditation process, the Evaluation and Quality Improvement Program (EQuIP), which involved a 3-year contract, health care organizations were expected to forward data 6-monthly in each year of the contract. They in turn were provided with a 6-monthly report, detailing as before aggregate results and their own results compared with their peer hospital. Peers were established by bed size, ownership (public/private) and other specialty determinants such as number of deliveries for obstetric hospitals, for example.

Table 2 illustrates the increase in the number of organizations submitting data for each year of the program. The average number of indicator sets being addressed by individual organizations was 4.5 and the average number of individual clinical indicators addressed was 25. This is a reasonable number. Some health care organizations do not provide the services for certain indicator sets and the ACHS

Table 2 Yearly growth of the program as shown by the number of available indicator sets, the total number of indicators, and the number of health care organizations providing data to the nationwide database

Year	Number of sets available	Number of clinical indicators	Number of organizations submitting data
1993	1	15	115
1994	1	18	127
1995	2	34	188
1996	7	124	243
1997	12	208	513
1998	15	228	552

does not want to unduly burden any health care organization's data collection resources. The number of actual clinical indicators in use did not remain constant as a revision process was established for each set. On a yearly basis each College/CEP working party reviewed the quantitative and qualitative information provided by hospitals, and according to a set of generic criteria such as the clinical burden, the precision of the indicators and their perceived usefulness, indicators might be revised or excluded from the program.

Of Australia's more than 1000 acute hospitals 80% have 100 beds or fewer. However, for the vast majority of Australia's large hospitals contracted in EQuIP, the database now reflects the majority of patient separations (discharges/transfers/deaths). Over the life of the program, more than 800 individual health care organizations have submitted data to the CEP. Some of these organizations have dropped out of the accreditation program, some have changed from acute to long-term care and others have amalgamated or closed, resulting in the current number of approximately 550 providing data. The denominator (the group at risk for the event) for several of the indicators is more than a million patients, for example patients with unplanned re-admissions or hospital-acquired bacteremia, both indicators being from the most popular set, the Hospital Wide Medical Indicators. Very large denominators were also obtained for the next most frequently addressed sets, namely those for day procedures and anesthesia. It is doubtful if this rapid and widespread uptake of the indicators would have been achieved if they were not part of an accreditation program that involves an 'on site' visit at which clinical performance, as reflected by the indicator monitoring, is addressed.

The emphasis in EQuIP is on demonstration by the health care organization of improvement in the provision of health care services. The clinical indicator project, which preceded EQuIP by 4 years, fitted in well with the EQuIP philosophy with no requirement for any major change to the ACHS clinical indicator policy.

A further strengthening of the medical provider/ACHS linkage in the indicator program occurred where an organization had identified a problem through indicator monitoring but had not been able to overcome that problem. In these cases the ACHS might recommend that the organization invite the appropriate professional provider group in to consult with it on the problem issue. Health care organizations that are not contracted with or part of EQuIP also contract with the ACHS to provide their results from clinical indicator monitoring and receive feedback on their performance. From January 2000, health care organizations in the New Zealand Accreditation Program (Quality Health New Zealand) will be contributing data using the same indicators. As the majority of the medical colleges (College of Surgeons, Physicians, etc.) are Australasian (Australia and New Zealand), there was no requirement for any modification to the indicators. Interest in contributing to the database (for example in order to obtain comparative 'peer' information) has also been expressed by other countries in Europe and Asia.

Data validation

In the introduction of the indicator program the ACHS did not lay down who should collect data on the indicators, and how these data should be collected. A regular process of data cleaning was undertaken, concentrating on inconsistencies in the data, but limitation of funding did not enable the CEP to assess the data accuracy by conducting on-site reviews. The health care organizations were advised to indicate whether or not the CEP definitions had been followed in collecting the data. If they had not, then that particular organization's data were not entered into the nationwide database and it was not possible to provide that organization with feedback on its performance.

As the database has grown, with 412 health care organizations providing data on the hospital wide indicators, variance in data collection methods (provided the definitions were adhered to) in any one or more hospitals is less likely to influence the mean aggregate rate. The data requirements for very few of the indicators could be met completely from administrative databases. The medical record was the main source of data but the organizations reported increasing use of computerized programs, enabling concurrent or prospective data collection over the years of the program.

As the indicators were provider-developed and generally 'evidence-based', the ACHS was confident of face and content validity but uncertain of reliability and reproducibility of the indicator data for the above reasons. Reproducibility of the data however, as shown with the yearly aggregate data for unplanned return to the operating room and hospital-acquired bacteremia (Tables 3 and 4), has clearly been demonstrated. For the years 1994–1996 data were reported from three different groups of hospitals, as they only reported in their survey year, and the results are remarkably similar.

The mortality data for coronary artery graft surgery demonstrate context validity and also reliability between two data collection periods [2]. Risk factors common to four scoring systems (such as those for mortality) are the age of the

Table 3 The yearly rates reported for the unplanned return of patients to an operating room, 1994–1998

Year	Rate
1994	0.6%
1995	0.5%
1996	0.51%
1997	0.56%
1998	0.53%

Table 4 The yearly rates for patients developing a 'hospital-acquired' bacteremia reported by health care organizations, 1994–1998

Year	Rate
1994	0.28%
1995	0.25%
1996	0.27%
1997	0.32%
1998	0.31%

patient, the state of left ventricular function, whether the surgery is emergency or elective, and whether it is initial or repeat surgery [3]. Table 5 illustrates results for the first 2 years of data collection for the indicator reflecting the mortality rate for coronary artery graft surgery on approximately 5000 patients in 1997 and approximately 8000 patients in 1998. The data clearly reflect the importance of the risk factors, demonstrate consistency across the 2 years and are comparable to published data [4].

Effectiveness of the indicators

Whilst the process of establishing and introducing the clinical indicators is complex and time-consuming it is, as Jewell stated, 'only the first step towards analyzing and changing clinician behavior' [5]. Kazandjian *et al.* claim that 'demonstrated usefulness is the best test of validity' of an indicator [6]. Health care organizations are requested by the ACHS to give qualitative information on actions they have taken as a result of indicator monitoring, together with their quantitative data. There are many stimuli to achieve improvement in clinical practice. The fact that organizations advise of actions taken directly in relation to a review of their indicator results demonstrates a 'responsiveness' on the part of the indicators. In 1997, 80% of the more than 500 organizations forwarding data to the ACHS were advised that they took action on more than 6000 occasions. This rose to over 10 000 actions from 95% of the organizations in 1998. These actions fell into the following areas:

- a review of the accuracy of the data/further quality activity, e.g. a new data collection sheet for wound monitoring;
- policy and procedure changes, e.g. a change in antibiotic prophylaxis for total hip joint replacement;
- educational programs, e.g. in thrombo-embolism prophylaxis;
- new appointments, e.g. discharge planning officer;
- equipment changes, for example numerous small items such as catheters.

Both process and outcome indicators were equally associated with action following indicator monitoring [7]. It was of interest to note that the percentage of organizations reporting actions increased rather than decreased in the years after the introduction of any particular set [7].

Responses to a particular set of indicators

Review of the nationwide database enables the determination of actions, in relation to any particular set of indicators, as shown for example with a set of generic indicators for day

Table 5 A comparison of mortality rates for patients undergoing coronary artery graft surgery for the years 1997 and 1998, by risk factors

	1997		1998	
Indicator description	Rate	95% Confidence interval	Rate	95% Confidence interval
Aged 50–70 years	1.5	1.1–2.1	0.92	0.64–1.28
Aged > 70 years	4.0	3.0–5.1	3.6	2.9–4.4
Ejection fraction > 0.35	1.4	0.7–2.3	0.79	0.29–1.71
Ejection fraction < 0.35	8.5	3.7–16.1	6.9	2.8–13.8
Elective	1.8	1.3–2.4	1.3	1.0–1.7
Emergency	6.5	3.8–10.2	5.1	3.3–7.6
Re-operation	4.4	2.4–7.4	5.5	3.6–7.9

Table 6 Health care organizations' responses to problems identified in monitoring of day procedure indicators

Clinical indicator	Action
Failure of patient to arrive	Better documented information for patients
Cancellation of procedure after arrival	More pre-admission clinics established
Unplanned return to the operating room	Alteration to surgical techniques
Unplanned overnight transfer	Restriction of procedures (as day cases)
Delay in discharge from day patient unit	Re-ordering of operations list (complex cases to be scheduled early)

procedures now reflecting the management of over 400 000 patients in a year (Table 6). Introduction of this set of measures is reported by health care organizations to lead to better education of patients through documented information concerning the preparation for a procedure, to establishment of pre-admission clinics to reduce the percentage of patients cancelled after arrival, to modification of operating techniques to avoid return to the operating room (e.g. pressure bandages to lessen the risk of hematoma formation), to restriction of complex procedures performed as day cases, to reduction in the number of patients who have an unplanned overnight transfer to an in-patient facility, and to the 're-ordering' of operation lists to reduce the number of patients who have an unplanned delay in discharge from a day procedure unit.

Examples of detailed responses

By combining quantitative and qualitative information, individual hospitals provide even more detail concerning the action taken after review of results obtained from monitoring a particular indicator. Some examples of these 'cameos' are as follows. (The heading for each example is the title of the relevant indicator.)

Hospital acquired bacteremia

Finding its hospital-acquired bacteremia rate above that of its peer group, one hospital revised its procedures for the maintenance of skin cleanliness at the site of central line insertions. As a result, over the next 12 months this hospital significantly reduced its bacteremia rate from 0.72% (47/6500) to 0.3% (16/5344).

Unplanned readmissions to hospital

In one hospital a number of unplanned readmissions were found to be due to complications after laparoscopic cholecystectomy. Privileges for the performance of that procedure were delineated in the hospital such that the procedure was restricted to those surgeons who had undergone appropriate training. This resulted in a fall in the number of unplanned readmissions.

Table 7 The number of health care organizations reporting and the number and rate for patients developing a post-operative wound infection following 'contaminated' surgery

	No. of hospitals	No. of patients	Denominator	Rate %
1994	55	184	6523	2.8
1995	68	387	17 534	2.2
1996	88	337	13 458	2.5
1997	187	969	40 667	2.4
1998	196	872	41 327	2.1

Monitoring of toxic drugs

Prior to the introduction of a clinical indicator on gentamicin serum monitoring (monitoring is necessary as gentamicin is nephrotoxic and ototoxic) one hospital recorded that only 40% of patients were having serum levels monitored. This rose to 85% after the introduction of the indicator.

Suicide/attempted suicide

In addressing this psychiatric facility indicator one hospital, recording a relatively high number of attempted suicides, replaced all of the curtain rails with rails recessed into the ceiling to obviate a persisting risk.

Unplanned return to the operating room

When evaluating a number of unplanned returns to the operating room an organization found that in the same month two elderly patients required further surgery for bleeding from a bowel anastomosis. Both patients had been taking aspirin regularly as a precaution against cardio-vascular complications. A new policy was introduced requiring cessation of aspirin 1 week prior to surgery. After the introduction of that policy no further cases of this nature occurred over the following 6 months (the next reporting period for the indicator data).

Whilst these are isolated examples, Maguire *et al.* have noted that 'unique events provoked global improvements in health care' [8]. Thus, provided that the new policies indicated in the examples are maintained, the beneficial effects should be ongoing in these health care organizations.

Table 8 A comparison of the results from patients suffering a wound infection after 'clean' surgery between hospitals that took action and those that did not take action in 1998 on their 1997 results

Action taken (*n*)	1997	1998	Difference
Yes (82)	1.95	1.71	Significant decrease
No (64)	0.92	1.09	Significant increase
Total	1.52	1.43	Non-significant

As health care organizations have provided continuous data since 1997 only, it is a little too early to determine trends. For this a timeframe of 5 years is advisable. However there appears to be a move in the right direction with some indicators as demonstrated, for example, by the yearly aggregate rates for in-hospital wound infection after 'contaminated' surgery (Table 7). Interestingly, although an overall aggregate rate may be unchanged, as with 'clean' wound infection, when the results for those hospitals that reported taking action on their 1997 results are aggregated and compared with the aggregate results of those that did not take action, there is a clear suggestion that the indicator was, in many hospitals, a stimulus for improvement (Table 8). Such events can be demonstrated across many of the indicator sets.

Future directions

A total of approximately 250 clinical indicators have been introduced with the co-operation of the medical colleges. Many of the indicators are, however, of limited value and it is anticipated that the yearly review processes will slowly reduce this number to a 'core' group of the most valuable and responsive measures. Certain criteria, such as the number of organizations addressing an indicator, the frequency of performance of a procedure, the level of responsiveness of an indicator, have been established for this task. Although the program has concentrated upon medical care, other disciplines have been involved, e.g. infection control nurses, pharmacists. It is appropriate, however, to consider the development of multi-disciplinary performance measures in the expectation that these will more directly reflect 'system' rather than individual provider management issues. A move to specificity of measurement is also necessary in some areas, for example the recording of a hospital wide wound infection rate is of less value to an individual provider than a specific infection rate such as that following total hip joint replacement. A further issue to consider is the extent of the timeframe for measurement. Whilst the timeframe of 'in-hospital' is appropriate for the majority of process indicators, in the case of outcomes the intermediate and longer term outcomes may differ from the early 'at discharge' outcomes. Measurement of care in the ambulatory setting is, however, likely to be a larger and more costly task.

Conclusions

Whilst the ACHS was not the only accreditation program to consider clinical indicators [9], it was the first organization to introduce indicators into the quality assurance process and its indicators remain unique in their clinical scope and in the formal provider involvement in their development. The inclusion of indicators in the accreditation process entails a discussion of results and actions with an external party at the time of survey. Clinician 'ownership' of the indicators, together with this discussion of the findings and feedback of comparative data from the nationwide database, have resulted in an extensive use of the indicators by health care organizations and stimulated many actions to improve patient care. The relatively 'soft' policy of the ACHS in not mandating a specific number of indicators or compliance with 'set' standards or rates has also contributed to the maintenance of an educational rather than punitive attitude to the clinical indicators. This has enabled the ACHS to achieve its aims of increasing the clinical component of accreditation and expanding clinician involvement in internal quality assurance programs, leading to documented evidence of improvement in patient management and outcomes.

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