Indicators for Drug and Therapeutics Committees

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Aims This study describes development and field testing of a set of indicators for drug and therapeutics committees (DTCs) in hospitals. It was intended that these indicators should be accessible, useful and relevant in the Australian setting.

Methods Candidate indicators were written following consultation and data collection. A framework of outcome, impact and process indicators was based on DTC goals, objectives and strategies. The candidate indicators were field tested over a 2 month period in teaching, city non-teaching, rural and private hospitals. The field tests provided response data for each indicator and evaluation of the indicators against criteria for accessibility, relevance, usefulness, clarity and resource utilisation. Consensus on which indicators to accept, modify or reject was reached at a workshop of stakeholders and experts, taking account of the field test results.

Results Thirty-five candidate indicators were tested in 16 hospitals. Twenty-two had a response from $>80\%$ of sites, 23 had a mean relevance rating >3.5, 19 had a mean usefulness rating >3.5, 27 were correctly interpreted by $>90\%$ of sites and 25 could be collected in an acceptable time. The most acceptable indicators required least data collection or provided data deemed useful for purposes other than the field test. At the consensus workshop 13 indicators were accepted with no or minor change, nine were accepted after major modification and eight were discarded. It was recommended that a further five indicators should be merged or subsumed into one indicator.

Conclusions This study has developed and field tested a set of indicators for DTCs in Australia. The indicators have been taken up enthusiastically as a first attempt to monitor DTC performance but require ongoing validation and development to ensure continuing relevance and usefulness.

Keywords: Pharmacy and Therapeutics Committees, indicators

Introduction

Drug and Therapeutics Committees (DTCs) have an established place in hospitals and many consider them pivotal to rational drug use. The proportion of hospitals in Australia with a DTC has risen in recent years; 94% in 1995 [1] compared with 70% in 1982 [2]. The activities of DTCs can be variously grouped into policy, regulation and educational activities, with the best mix dependent on the problems confronted and the organisational structure in which the committee operates. A survey of DTC activities found these related to the type and size of the hospital but that there was considerable variation even between hospitals of the same type [1]. Moreover, the level of activity fell short of that expected by stakeholders such as clinicians, administrators and patients.

Several authors [3–5] have discussed the requirements for a successful DTC based on the experience of DTC members. There has been little empirical work, however, to measure the performance of DTCs in an objective way. DTC members attending a seminar in 1994 [6] cited a need for measures to monitor performance and the effect of reforms or educational initiatives. Indicators were identified as a useful tool in this context. This paper reports a study to develop and field test indicators for DTCs that are accessible, useful and relevant in the Australian hospital setting.

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Methods

A steering committee oversaw the study. Its membership included clinicians, quality improvement experts, DTC members, pharmacists and consumer representatives.

Candidate indicators

The goals, objectives and strategies necessary for effective DTC operation were identified by reference to previous data [1], published literature and consultation with experts on hospital-based drug use. The appropriateness of the goals, objectives and strategies was subsequently confirmed with the DTC in each field test site.

Candidate indicators were written using the framework established in the National Manual of Indicators for Quality Use of Medicines [7] using process, impact and outcome classifications.

The candidate indicators were drafted by the study team, reviewed by the steering committee and pilot tested by 10 Directors of Pharmacy from a range of teaching, non-teaching, city and rural hospitals.

Field tests

Hospitals were invited to be field test sites for the project. The invitation to participate was made specifically to the DTC, most commonly through the Chairman. Selection of field test sites included a mix of hospital types (teaching, non-teaching, public and private), settings (city, regional and rural) and geography (four Australian States). Most important, however, was willingness of sites to participate in the field tests which required a significant time commitment from DTC members.

A project officer visited each site and met with, typically, two to four DTC members to explain the data collection and evaluation requirements of the field test. The use of standardised data collection forms which recorded raw data was explained. The DTC at each site was asked to provide responses to as many indicators as possible for the previous 12 month period (January–December 1994). For indicators requiring survey data it was suggested that the DTC use any relevant data they may have or otherwise indicate, in principle, if the data could be collected over a 12 month period.

At the end of the 2 month field test period, the Project Officer revisited the sites and using a semi-structured interview recorded the response to the indicator question, accuracy of interpretation and data collection time. Participants were asked to score the relevance of each indicator for the hospital or health system and its usefulness as a management or reform instrument for the DTC. The scores were made on visual analogue scales from 0 (of no value) to 5 (essential).

Evaluation

The evaluation criteria required that: the data were accessible—assessed as a response from $>80\%$ of sites; the indicator was useful for management and reform of the DTC—assessed as a mean score of >3.5; the indicator was relevant to the hospital or health system—assessed as a mean score of >3.5; the indicator was unambiguous—assessed as correctly interpreted by $>90\%$ of sites; and the data collection time was acceptable—assessed as acceptable by $>90\%$ of sites. Failure to meet these criteria was a signal to the consensus workshop to modify or discard an indicator.

Consensus workshop

The field test results were considered by a consensus workshop which was charged with accepting, modifying or rejecting each indicator. The workshop categorised each indicator as core—suitable for interhospital comparison—or complementary—suitable for intrahospital comparison over time. Participation at the workshop was by invitation and included representatives from the field test sites, clinical pharmacologists, DTC members, pharmacists, consumer representatives, insurers, administrators and government representatives.

Results

Candidate indicators

Thirty-five candidate indicators were developed. These comprised four outcome, seven impact and 24 process indicators based on the DTC goals, objectives and strategies below:

- Goal

—To improve the health and economic outcomes of hospital care resulting from drug use.

- Objectives

—To ensure availability of safe, efficacious and cost-effective medicines
—To ensure affordability of medicines to the hospital
—To ensure quality (judicious, appropriate and safe) use of medicines.

- Strategies

—Policies for availability, affordability and quality use of medicines.
—The Committee and its decisions
—an active, credible and sustainable committee
—sound and transparent decision making processes
—efficient management of resources.
—Promotion of quality therapeutics through
—implementation of standards of care.
—educational and behavioural interventions.

The candidate indicators (Table 1) were presented in standard format, stating the indicator question, response type (e.g., percentage), definitions, purpose, scope, source and method for data collection and limitations of the indicator.

Field tests

Indicators were field tested in 16 hospitals: five teaching, three city non-teaching, four regional or rural and four private hospitals. Fifteen hospitals attempted all indicators and one private hospital attempted only a self-selected sample.

Of the 35 indicators, 22 had a response from $>80\%$ of sites. The indicators with a poor response rate all required some data collection although two (OT1, OT2) should have been available through automatic data capture. The most common reason for not providing a response was the activity had not been undertaken in 1996 or lack of time during the field test period. The sites which did not provide a response to the indicator were still asked to provide usefulness and relevance ratings (Table 2).

Nineteen of the indicators had a mean usefulness rating >3.5 and 23 had a mean relevance rating >3.5. The reasons for low ratings of indicators included: the indicator was perceived as a clumsy or inaccurate measure (PR6, PR14, PR15, IM5, OT3); the indicator measured a low priority activity (PR19, PR23, IM3); or, the activity while potentially desirable was not part of current practice (PR9, PR11, PR13). The latter group of indicators scored significantly worse in private hospitals (Table 3).

Twenty-seven of the indicators were correctly interpreted

Table 1 Candidate indicators used in field tests.

Process indicators	
PR1	Does the DTC have a defined place in the organisational structure with clear authority and accountability?
PR2	Does the DTC have a stated mission, terms of reference and plan?
PR3	Does the DTC have authority to make decisions on the availability and use of drugs in the hospital?
PR4	Does the DTC meet more than 3 times per year?
PR5	Proportion of DTC members who attend more than 50% of meetings?
PR6	Proportion of resources (as a function of drug budget) allocated to DTC activities?
PR7	Are representatives from stakeholder groups either members of the DTC or available for consultation to assist decision making?
PR8	Are DTC decisions evaluated by peer review?
PR9	Does the DTC have a formal appeals mechanism?
PR10	Is the rationale for individual decisions documented and available to stakeholders?
PR11	Proportion of submissions for formulary addition compliant with guidelines?
PR12	Does the DTC have a mechanism for consideration of non-formulary requests?
PR13	Does the DTC have a procedure for dealing with coercion from biased influences?
PR14	Number of drugs deleted from the formulary in the past 12 months?
PR15	Proportion of agents from a particular drug group (NSAIDs or ACE inhibitors) on the formulary?
PR16	Are drug policies endorsed and promulgated by the DTC?
PR17	Proportion of the target population who received a specified drug guideline?
PR18	Does the DTC have a policy on drug promotion in the hospital by the pharmaceutical industry?
PR19	Does the DTC encourage and promote implementation and monitoring of policies to assist discharge patients maintain a medication regimen?
PR20	Has the DTC ensured that it or another body has implemented and monitors a policy on drug use for unregistered indications?
PR21	Does the DTC have an annual plan for educational activities?
PR22	Did the DTC sponsor or coordinate educational activities including provision of objective information or audit-feedback services that focus on drug use?
PR23	Does the DTC interact with media or consumer groups to provide/ receive feedback?
PR24	Are educational resources or activities available for DTC members to develop their role on the committee?
Impact indicators	
IM1	Proportion of DTC decisions for which appropriate clinical and economic information was available?
IM2	Proportion of DTC policy decisions that have been implemented in past 12 months?
IM3	Percentage over run on hospital drug budget?
IM4	Proportion of target audience who report using a specified drug guideline?
IM5	Number of complaints received from health professionals about inappropriate pharmaceutical industry detailing?
IM6	Proportion of drug usage for a specified condition which is compliant with guidelines?
IM7	Number of adverse drug reactions reported to the national database?
Outcome indicators	
OT1	Mortality rate per annum due to adverse consequences of drug use in hospital?
OT2	Morbidity rate per annum due to adverse consequences of drug use in hospital?
OT3	Number of cases of index antibiotic resistant micro-organisms per annum?
OT4	Percentage growth in total drug expenditure as a proportion of percentage growth in total hospital expenditure per annum?

by $>90\%$ of sites and 25 could be collected in a time frame acceptable to $>90\%$ of test sites.

Post hoc analysis revealed that private hospitals often responded differently to public hospitals. Indicators considered irrelevant by all private hospitals (mean relevance score ≤ 2.0) included PR9, PR11, PR12, PR13, PR14, PR15, PR23, IM1, IM3, OT4. The mean relevance scores for indicators which related to formulary management and cost containment were significantly lower in private hospitals (Table 3).

Some the indicators had low response rates (PR17, IM4, IM6, OT1, OT2) because of the complexity of data collection. The high usefulness and relevance ratings for these indicators were consistent with comments from sites that they would have provided data if the test period had been longer.

Consensus workshop

Workshop participants recommended that 13 indicators should be accepted essentially unchanged, nine should be accepted after substantial changes and eight should be rejected (Table 4). It was recommended that five indicators should be merged as a discrete sub-question or subsumed into a single question. (Table 5).

Discussion

This study reports the development and field testing of a set of indicators for drug and therapeutics committees. A collaborative approach was taken to encourage 'grass roots' participation in design and selection of indicators. This emphasis was considered essential to the success of the project which required substantial time commitments from those involved.

The design of the indicators has been based on goals, objectives and strategies identified as important to effective operation of DTCs. Their usefulness for management and reform, relevance to the health system and clarity have been tested. This permits confidence in the face and concurrent validity of the indicators but does not address the more critical issue of correlating compliance with indicators with

Table 2 Aggregate responses from the field test sites ($n=16$).

	Number of sites providing a response (%)	*Number of sites incorrectly interpreting the indicator (%)*	*Mean ± s.d. usefulness rating*	*Mean ± s.d. relevance rating*	*Number of sites reporting excessive data collection time (%)*
PR1	15 (94)	0	4.13 ± 0.81	4.56 ± 0.63	0
PR2	16 (100)	1 (6)	4.15 ± 0.89	4.34 ± 0.82	0
PR3	15 (94)	1 (6)	3.91 ± 1.55	4.38 ± 1.22	0
PR4	16 (100)	0	4.13 ± 1.15	4.25 ± 1.13	0
PR5	16 (100)	0	4.25 ± 0.68	4.44 ± 0.51	1 (6)
PR6	12 (75)	0	**2.75 ± 1.44**	**3.19 ± 1.38**	0
PR7	15 (94)	0	4.10 ± 1.0	4.21 ± 0.90	0
PR8	14 (88)	**3 (19)**	3.75 ± 1.39	4.19 ± 1.05	0
PR9	15 (94)	**2 (13)**	**2.53 ± 1.16**	**2.73** ± 1.19	0
PR10	16 (100)	1 (6)	4.38 ± 1.02	4.44 ± 1.03	0
PR11	**11 (69)**	**2 (13)**	**2.88 ± 1.59**	**3.06 ± 1.57**	**2 (13)**
PR12	**12 (75)**	1 (6)	**3.38 ± 1.59**	3.56 ± 1.59	0
PR13	13 (81)	0	**2.44 ± 1.31**	**2.56 ± 1.31**	0
PR14	**11 (69)**	1 (6)	**3.00 ± 1.55**	**2.88 ± 1.54**	**2 (13)**
PR15	15 (94)	1 (6)	**3.19 ± 1.68**	**3.37 ± 1.58**	0
PR16	15 (94)	0	4.46 ± 0.72	4.48 ± 0.68	0
PR17	**6 (38)**	1 (6)	3.88 ± 1.20	4.13 ± 1.02	**2 (13)**
PR18	14 (88)	0	3.66 ± 1.28	3.84 ± 1.35	0
PR19	16 (100)	**7 (44)**	**3.25 ± 1.61**	**3.50 ± 1.55**	0
PR20	15 (94)	**3 (19)**	4.00 ± 0.97	4.25 ± 0.86	0
PR21	15 (94)	0	**3.38 ± 1.36**	3.75 ± 1.06	0
PR22	15 (94)	0	**3.50 ± 1.31**	3.84 ± 0.71	0
PR23	16 (100)	0	**2.16 ± 1.12**	**2.09 ± 0.97**	0
PR24	16 (100)	0	**3.38 ± 1.31**	3.63 ± 1.20	0
IM1	11 (69)	1 (6)	3.71 ± 1.65	3.98 ± 1.40	0
IM2	14 (88)	**3 (19)**	4.00 ± 1.26	4.06 ± 1.24	**2 (13)**
IM3	**9 (56)**	1 (6)	**2.94 ± 1.61**	**2.88 ± 1.54**	0
IM4	**10 (63)**	1 (6)	4.00 ± 1.21	4.31 ± 0.70	**3 (19)**
IM5	**12 (75)**	**2 (13)**	**2.75 ± 1.39**	**3.00 ± 1.37**	**2 (13)**
IM6	**5 (31)**	0	4.13 ± 0.96	4.13 ± 0.96	**3 (19)**
IM7	**10 (63)**	1 (6)	3.81 ± 1.38	4.25 ± 0.86	0
OT1	**2 (13)**	1 (6)	3.94 ± 1.44	4.00 ± 1.41	**5 (31)**
OT2	**8 (50)**	0	4.20 ± 1.26	4.47 ± 0.83	**4 (25)**
OT3	**12 (75)**	**4 (25)**	**2.47 ± 1.24**	**2.60 ± 0.86**	**2 (13)**
OT4	**11 (69)**	0	**3.38 ± 1.54**	**3.38 ± 1.54**	0

Table 3 Mean scores (± s.d.) for public and private hospitals for indicators that demonstrated a significant difference in relevance ratings.

	Public hospitals	*Private hospitals*	P-*value*[a]
PR9	3.11 ± 0.80	1.22 ± 0.95	< 0.01
PR11	3.58 ± 1.38	1.50 ± 1.00	< 0.05
PR12	4.33 ± 0.89	1.25 ± 0.50	< 0.01
PR13	3.00 ± 1.21	1.25 ± 0.50	< 0.05
PR14	3.42 ± 1.38	1.25 ± 0.50	< 0.05
PR15	4.00 ± 1.21	1.58 ± 0.68	< 0.01
PR21	4.17 ± 0.58	2.50 ± 1.29	< 0.05
IM1	4.47 ± 0.56	2.25 ± 1.50	< 0.05
IM3	3.25 ± 1.29	1.25 ± 0.50	< 0.05
OT4	3.83 ± 1.11	2.00 ± 2.00	ns

[a]Mann Whitney-U test.

quality drug use or indeed desirable patient outcomes. Such a validation was beyond the scope of this study but remains an important subject for future work. This set of indicators, therefore, could be used to monitor DTC performance assuming the current consensus of best practice is well founded but would be unlikely to cause a shift to a more effective paradigm.

The indicators which were found to be most acceptable to field testers were those requiring least data collection or providing information which was valuable for other management tasks. This is consistent with other work on implementation of performance indicators. A shortcoming, however, is that such indicators are more likely to monitor strategies than objectives or goal attainment. They typically identify if processes and policies are in place but not whether they influence practice or outcomes. It would be important in subsequent work to move toward more impact and outcome indicators but this will require better integrated information systems.

There is potential for selection bias in this study. The selected sites agreed to undertake substantial data collection, consequently only those who believed there may be some value in indicators were likely to take part. However, of 18 sites invited to partcipate in the study only two declined.

Table 4 Recommendations of the consensus workshop.

Recommendation	*Indicators*
Accept unchanged or with minor modification	PR1, PR2, PR5, PR7, PR10, PR17, PR18, PR22 IM1, IM4, IM6, IM7 OT2
Accept only after major modification	PR6, PR11, PR12, PR14, PR15, PR19, PR20 IM2 OT1
Reject	PR8, PR13, PR23, PR24 IM3, IM5 OT3, OT4
Merge with another indicator	PR3, PR4, PR9, PR16, PR21

Table 5 Final set of indicators for drugs and therapeutics committees.

Process indicators	
Core	Does the DTC have an established place in the organisational structure, with clear authority and accountability?
	Does the DTC have a mission statement; terms of reference; strategic plan?
	Do the terms of reference include provision for:
	Authority to make decisions on availability and use of drugs;
	Processes for implementation and evaluation of drug policy;
	Mechanism for appeal of DTC decisions;
	Policy and procedures for declarations of conflicts of interest;
	Regular meetings (business to be addressed within 3 months of receipt)?
	Are resources specifically allocated to the DTC for ongoing operations?
	Are representatives from the following groups either members of the committee or available for participation in decision making:
	(a) Medical practitioners; (b) Nurses; (c) Pharmacists; (d) An expert in therapeutics; (e) A person who brings a community health perspective; (f) A person who brings a societal view?
	Is the rationale for decisions documented and available to stakeholders?
	Are there guidelines on the information required for submissions for formulary addition?
	Are requests for non-formulary drugs for individual patients dealt with using a standard mechanism that is overseen and ratified by the DTC?
	Has the formulary been critically reviewed in the last 12 months?
	Is there a DTC-endorsed policy on drug promotion?
	Does the DTC support implementation of policies that assist discharged patients maintain their medication regimen?
	Has the DTC ensured that the hospital has a policy for unregistered and alternative drug use?
	Does the DTC review all cases of mortality attributable to preventable adverse drug reactions or medication errors?
	Were any of the following activities supported or endorsed by the DTC:
	(a) Provision of written material to health workers; (b) Detailing of objective information to prescribers; (c) Audit and feedback of data to health workers; (d) Lectures/workshops on therapeutics?
Complementary	Proportion of members who attend more than 50% of meetings
	Proportion of agents on the formulary from specific drug group. Calculate for (a) general anaesthetic agents; (b) parenteral cephalosporins.
	Proportion of target audience who received a specified drug guideline. Calculate for (a) doctors; (b) nurses.
Impact	
Core	Percentage of submissions for additions to the formulary for which the DTC had:
	(a) balanced, comparative information on clinical efficacy & safety; (b) economic analyses; (c) an assessment of clinical need?
	Percentage of new drug policies which were adopted?
Complementary	Expenditure on non-formulary drugs as a percentage of total drug expenditure?
	Percentage of target audience who report using a specified drug guideline. Calculate for (a) doctors; (b) nurses
	Percentage improvement in compliance with drug guidelines for a specified condition following implementation of an intervention?
	Number of adverse drug reaction reports per 1000 beds forwarded to the national database per annum
Outcome	
Core	Rate of morbidity due to preventable adverse drug reactions or medication errors?

Anecdotally, we have observed changes in several DTCs since field testing. These have included introduction of drug utilisation evaluation, inclusion of consumer representation on the committee and introduction of strategic planning to DTC work.

Other authors have identified several strategies as necessary to DTC effectiveness. Bochner *et al.* [8] commented that formulary management and drug use evaluation were important for DTCs dealing with capped budgets. Jarry & Fish [9] supported involvement of practicing physicians in DTC decision making for acceptance of decisions and consequently effective DTC operation. These commentators also drew attention to the goal of DTCs being concerned with total patient care and the total cost of care. Summers & Szeinbach [10] suggested that an effective DTC had educational, communication and advisory roles and was composed of physicians, pharmacists and nursing representatives.

Mannebach *et al.* [11] have reported a study which focused on the structural and organisational factors that affect DTCs. They identified performance measures such as average length of stay, number of drugs added and number of drugs deleted from the formulary, percentage of nonformulary requests approved, efficiency index and casemix index. Some of these indicators were investigated in our study. Field testing found the number of drugs deleted from the formulary to be a fairly meaningless indicator when used in isolation. Several test sites commented that variations over time were confounded by the cycle of formulary review which may be longer than a year. One of the principal findings of the study by Mannebach was that the type and number of drugs on the hospital formulary was a significant factor for all performance measures which leads the authors to conclude that formulary decisions were important determinants of DTC and institutional performance [11]. This finding is supported by our own study in public hospitals where indicators concerning decision making and formulary management were highly scored. However, we did not find the same to be the case in private hospitals which were subject to a different funding system. This highlights the importance of understanding the environment in which the DTC is operating before implementing performance measures.

In conclusion, this study has developed and field tested indicators for DTCs in Australia. These indicators have been taken up enthusiastically as a first attempt to monitor performance. Further validation and ongoing development will be essential to ensure the indicators remain relevant and useful to decision makers on DTCs.

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