QUALITY ASSURANCE IN THE USA – STATE OF THE ART?

A report on the state of quality assurance in healthcare in the United States of America, based on the findings of a series of study visits to hospitals, healthcare organisations, healthcare researchers, quality assurance specialists and practicing clinical staff in the USA in the autumn of 1990.

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March 1991

Acknowledgements

The study visit to the USA on which this report is based was funded by a National Health Service Training Authority (NHSTA) Kings Fund Travel Fellowship and by Brighton Health Authority. My thanks to both sponsors for enabling me to observe and learn from American healthcare practice at first hand.

Particular thanks are due to Jim Coles, Associate Director of CASPE Research, and Dr Jenny Bennett, Consultant in Public Health Medicine with Brighton Health Authority, for their help in planning and arranging the study tour itinerary.

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1. Introduction

1.1 Looking in from the outside

It is pointless to try, in the short space of time afforded by a study visit, to understand all the intricacies and workings of another country's healthcare system. This is especially true when the country in question is the United States of America, whose healthcare system is probably the most extensive, complex, fragmented and variable system in the world. This means that the visitor returns with only a part of the whole picture, and it is easy to misconstrue or misinterpret what has been learnt, by extrapolating to construct the unseen, or by overestimating or understating the true importance of the ideas heard, initiatives seen, and experiences gained.

So what can a study visit achieve? It offers an opportunity for face to face discussion and direct experience to build on existing knowledge and understanding. It places ideas, techniques and developments which are already understood in theory in a real, working environment. It gives a snapshot of current practice and thinking, and it allows some of the important future directions and dimensions to be discerned.

This study visit had three main aims, which were directly related to the research work that CASPE Research and Brighton Health Authority have been carrying out for some time in quality assurance and medical audit:

1. To develop a better understanding of the use of a specific quality assessment technique - occurrence screening - in the USA, and its place in the field of quality assurance.

2. To review the quality assurance mechanisms in place in the US healthcare system, and their perceived success in measuring and improving the quality of care, and to identify future trends in the development of quality assurance.

3. To identify how the extensive range of quality assurance research in the USA, and the American experience in organising and implementing quality assurance, might be used to help the British National Health Service at a time when it is seeking to develop the processes of medical audit, clinical audit, and quality assurance.

1.2 Using this report

The rest of this report is split into four main sections. Section 2 explores the background to the US healthcare system, including its development, and the parallel development of the

quality assurance function. It also briefly considers the current political and financial environment within the USA, and its effects on the healthcare system.

Section 3 gives an overview of the quality assurance mechanisms in place in the USA, and how they work in practice. Some of the supporting material for section 3 is contained in the appendices to this report. Section 4 considers the new directions and future trends in quality assurance in the USA, and their effects on the existing quality assurance systems. Section 5 draws some broad conclusions about the role of quality assurance in the US healthcare system, and considers how relevant the US experience is to the present NHS.

The appendices to the report contain details of the study visit itinerary and a small illustrative selection of the quality assurance materials and information gathered during the study visit.

2. Background

2.1 The development of healthcare in the USA

The United States healthcare system has always been predicated on the primacy of the individual in American culture and society. In international terms, it is perhaps closer to being a free market (in the economic sense) in healthcare than any other system. It is characterised by a huge number of providers (sellers) and payors (buyers) of healthcare; a high degree of consumer sovereignty, expressed both as consumer choice and as individual consumer responsibility for payment; and an almost complete absence of central co-ordination or planning of services.

Many of the strengths and weaknesses of the US healthcare system can be directly traced back to its unique structure. For example the high level of external regulation and inspection arising from the need to control the actions of a welter of independent healthcare providers; the bureaucracy of American hospitals arises from a need to invoice and account for each patient individually; the overprovision of services and duplication of facilities results from competition for customers amongst providers; the domination of acute services results from the peripheralisation of consumers with long-term or chronic conditions because they lack healthcare resources; and the complete exclusion of over 30 million people from the healthcare system results from the vesting of responsibility for payment in the individual. By contrast, the high quality of buildings and equipment, and the availability of pioneering high technology acute care result from the aggressive competition amongst providers; the attentiveness to consumer choice and customer needs arise from the power of the consumer to take business elsewhere; and the absence of waiting lists for treatment or rationing of services results from an absence of inflexible cash limits on total spending.

2.2 The development of quality assurance in healthcare in the USA

Quality assurance in the US healthcare system has also been formed by its environment. The need for controls in a near-free market has caused it to focus on the appropriateness of care, inspection and external regulation; the commercial ethos of providers has led it to concentrate on quality of service (and risk of litigation) rather than quality of health. And other dimensions of quality - such as equity, accessibility of services, and relevance of services to general social need, have been neglected, because of the relatively lower value placed on these characteristics by the healthcare system.

The Hospital Standardisation Program, founded by the American

College of Surgeons shortly after their own inception in 1912, was the first quality assurance methodology to be widely used in the US healthcare system. It was conceived as a way of guiding hospitals towards high professional standards in medical practice, with the cooperation of the healthcare professionals who worked within them - a principle which continued to be the foundation stone of quality assurance in the USA until the late 1960's and early 1970's. Gradually, however, the focus shifted away from the arms-length regulation of a respected profession, and towards the detailed inspection and regulation of healthcare organisations to make sure they were doing all they should be. The rise of medical negligence litigation, and falling levels of public respect for the professional doctor contributed to a groundswell of demand for public accountability in health services. In its turn, this was replaced in the late 1970's and early 1980's by an overriding concern about the soaring cost of healthcare, and a preoccupation in quality assurance with the appropriateness or necessity of the provision of healthcare services. There are now signs, in the widespread espousal of the philosophy of continuous quality improvement, that at least in some parts of the healthcare system a return to quality assurance based on the participation and cooperation of clinical professionals in maintaining high standards of care may be taking place.

2.3 Current financial and political pressures

To understand the current concerns in the US healthcare quality assurance system, it is helpful to delineate some of the important wider political factors at work. The cost of healthcare continues to rise, despite the introduction of prospective payment, and the development of comprehensive appropriateness review for individual patient therapies. The continuing pace of technological advance, combined with the demographic and political pressures of an ageing population make it certain that pressure on resources will continue to grow. The level of public satisfaction with the healthcare system is low, with the main concerns being overall cost and access to services - particularly for the growing number of poorly paid uninsured working people who effectively have no healthcare provision whatever. The overall financial climate is unfavourable - particularly for public spending, because the government is struggling with a massive public expenditure deficit. And within the healthcare industry, many providers are finding it hard to survive because of the pressures of intense competition. In short, the US healthcare system faces growing demand for services coupled with restricted resources to provide those services - not unlike the British National Health Service.

3. Quality assurance in action

3.1 **Hospital quality assurance programmes**

Every hospital in the USA has its own quality assurance (QA) programme. Although they vary enormously in resourcing and sophistication, their main aims are generally the same - to comply with federal, state and payor regulations; to minimise commercial risk exposure; and to maintain the reputation and standards of the institution.

It was notable that every hospital visited based its QA programme to some degree on occurrence screening - detecting, investigating and analysing adverse events in patients' care and treatment. For example, the New England Medical Center in Boston used clinical occurrence screens applied by quality reviewers (of whom there were 5.5 WTE to cover 455 beds). At the Johns Hopkins Health System, a similar system of occurrence based review was in place, with reviews taking place concurrently, and the information being used by utilisation review, risk management and quality assurance staff (see Appendix A). At the Good Samaritan Hospital near Chicago, a similar system was used, and the Henry Ford Hospital in Detroit approached the process in the same way. Although the terminology sometimes varied, and the methods for occurrence detection and review differed, it seemed that occurrence screening systems were the dominant quantitative technique in hospital quality assurance.

Hospitals varied in the ways they were presenting and using the information yielded by their occurrence screening programme. Generally, occurrences were either listed or counted, and individual doctor's rates of occurrences were compared (see Appendix B). That information was presented to medical and managerial committees, and used in granting or withdrawing doctors' admitting rights. There seemed to be a lack of imagination in information analysis and presentation, and a focus on placing the responsibility for events with medical staff. Of course, occurrence data was also used by the risk managers in all hospitals, to identify potential litigants.

The larger institutions had other elements in their quality assurance programmes - such as a large patient satisfaction and health status measurement project (New England Medical Center) and an indicator piloting project for the "Agenda for Change" programme (Good Samaritan Hospital). However, these programmes were largely peripheral to the quality assurance activities of the hospitals concerned, being research-oriented initiatives.

The most striking feature of hospital quality assurance programmes was the amount of time and effort devoted, both by dedicated QA staff and by practising clinicians, to operating and managing the quality assurance activities. A bureaucratic welter

of committees spent considerable amounts of time reviewing the results of quality assurance, and painstakingly tracking and following up reviews and responses to reviews of individual cases (see Appendix C). Although at all the hospitals visited, the overt ethos of the QA programme was participative, constructive, and non-punitive, the reality was somewhat different. The committee structure led to repeated discussions of individual cases, and seemed preoccupied with attaching blame to individuals for events, rather than with tackling organisational problems. Much of the review process seemed defensive - aimed at protecting the hospital against external agencies such as payor reviewers, state and federal regulators, and litigious patients.

3.2 **Comparing performance in quality assurance**

Hospitals which were part of a larger hospital group (such as the New England Medical Center) or a hospital chain (such as Catherine McAuley Health Center in Ann Arbor, part of the Sisters of Mercy Health Services corporation) made considerable use of interhospital comparisons to evaluate the quality of care in individual hospitals or the standards of performance of clinicians. The interhospital comparisons were piggybacked on hospital quality assurance programmes, drawing on data that was collected for use within the hospital itself. This information was reported, along with activity and financial data, to the hospital group headquarters, and processed to produce reports such as that shown in Appendix D. These comparative performance analyses have much in common with the NHS Health Service Indicators (HSI) programme, although in general the information base on which they draw is more detailed and richer in terms of the quality related information it contains.

Although there is no single central database of information on hospital performance, because of the free market structure of the healthcare system, and the commercial competitiveness amongst provider organisations militates against the free interchange of information, large comparative databases do exist. The largest such database is maintained by the Commission on Professional Hospital Activities (CPHA), based in Michigan. For over thirty years, CPHA has provided a large number of hospitals with access to a patient-based database (the Patient Activity Survey - PAS) based on their own patients and those of all other participants. By contributing its own data to the database, each hospital gains access to a massive database which can be used to compare its own performance in many dimensions to that of a number of anonymised comparison groups. Appendix E illustrates the use to which this information has traditionally been put - the production of detailed statistical analyses of activity levels, resource usage and quality of service.

The uses to which the comparative database maintained by CPHA is put have become more sophisticated, as both the quality and

quantity of data available have increased, and as the statistical sophistication of the analytical techniques available have improved. For example, a series of clinical indicators, intended to provide a more clinically pertinent view of the quality of care, have been developed (see Appendix F). These indicators use diagnostic and procedural coding data to produce objective measures of quality, such as rates of infection, rates of perioperative death, and so on. More complex methodologies for data analysis have yielded a series of risk adjusted indexes of quality - the Risk Adjusted Readmission Index (RARI), Risk Adjusted Mortality Index (RAMI), and Risk Adjusted Complications Index (RACI). These measures are far from being simple to calculate or indeed to understand, but they offer a way of comparing the performance of quite different institutions, making allowances for the differences in demographics, case-mix and character which might otherwise be cited as reasons for differences in their performance.

However, perhaps the most promising way of making the comparative database more useful is to broaden the base on which it is founded, by extending the data set that is collected on each patient. A more comprehensive data set will always be preferable to using clever statistical techniques on a limited set of data. Because all American hospitals have detailed patient billing systems, which invoice individual patients for all clinical services, there is a large quantity of data available for analysis which has not been used in the past in evaluating the quality of care provided. This data has traditionally been neglected because it has not been collected in a standard format (financial coding systems have varied from hospital to hospital) and the very size of the database has made the costs of data storage and processing prohibitive. In response to this situation, CPHA has developed the International Classification of Clinical Services (ICCS), as a tool to facilitate the mapping of hospital clinical service databases to a large interhospital comparative database. ICCS is now being used to build a much more extensive comparative database, which can support far more detailed and precise analyses of quality issues (see Appendix H). For example, using ICCS, interhospital variations in the use of antibiotic prophylaxis in total hip replacements and resulting rates of postoperative infection can be identified and investigated.

As comparative databases have grown in size and sophistication, so the problems facing those who use them have changed. Data availability is now much less of an issue. Data interpretation and presentation have become much more important. Data users do not want to be overwhelmed with information - they do want to be presented with relevant information on the important or critical aspects of their hospital's performance. Appendix I contains advice, designed for hospital board members, on using and interpreting the information available to them.

3.3 Accreditation of hospitals and healthcare organisations

The Hospital Standardisation Programme, established by the American College of Surgeons in 1917, set out to evaluate hospitals against a simple minimum standard. Between 1917 and 1951, the programme grew and spread, until over 3,200 hospitals had been surveyed and met the required standards. In 1952, the Joint Commission for the Accreditation of Hospitals (JCAH) was founded to take forward the ACS programme. Today, renamed the Joint Commission for the Accreditation of Healthcare Organisations (JCAHO), it remains an independent, non-governmental, voluntary body. Nevertheless, because accreditation is demanded by all federal and state payors, and by many health insurance companies, almost all the 6,500 hospitals in the USA are now in the JCAHO's accreditation programme, to which there is effectively little or no alternative. To achieve accreditation, they must satisfy a team of surveyors at least once every three years that they meet the complex and detailed standards laid down in the 323 page JCAHO accreditation manual for hospitals. An example of the standards for a single department - emergency services - can be found in Appendix J.

The effort involved for hospitals undergoing accreditation is massive, and some hospitals seem to resent the power of the JCAHO, and its continuing development and updating of the standards that hospitals are expected to meet. Accreditation is often criticised on two counts: that it assesses the structure of hospital services, and examines the administrative procedures and organisational structures, without actually focusing on the care patients receive; and that it encourages hospitals to adopt a cyclical adherence to quality assurance, with a peak of activity at the time of accreditation, and a trough of indifference in between.

It was in part to address these two issues that the JCAHO embarked on its "Agenda for Change" research programme in 1989 (see Appendix K). Through this programme, the JCAHO aims to develop and then implement clinical indicators of quality which can be used to continuously monitor the quality of care that hospitals provide. These indicators (see example in Appendix L) have been developed through a number of clinician panels, using relevant research findings, and are now being trialed in pilot hospitals. The Agenda for Change programme has fallen behind schedule mainly because it has proved harder than expected to develop clinical indicators which are valid, reliable and practicable indicators of the quality of clinical care. The early indicator sets were criticised for being overambitious, and requiring hospitals to collect large and complex new sets of data. Nevertheless, the JCAHO still aims to use the new clinical indicators more and more in the process of accreditation - both in deciding when a hospital needs an accreditation survey, and in focusing the survey on areas of the hospital's performance

which require investigation.

3.4 External review by payors

Over the last decade, the external review of the care and treatment given in individual cases by hospitals has become much more common. These reviews, carried out by health insurance companies, state health payors, and federal agencies such as Medicare, are intended to assure the payor of three things - that the admission and treatment of the patient was appropriate and necessary; that the quality of care the patient received while in hospital was of a high enough standard; and that the resources used to treat the patient were minimised.

By far the largest external review agency network is the system of Peer Review Organisations (PRO's), which were established by federal statute in 1982 to review the care of patients whose healthcare is financed by the Medicare programme. For example, MassPRO (the Massachusetts Peer Review Organisation) reviews around 72,000 cases each year, at a cost of around $5 million. Across the USA, the PRO programme costs approximately $315 million each year. Each PRO reviews a fixed sample of Medicare patients (determined by the Healthcare Financing Administration in Washington) using an Appropriateness Evaluation Protocol (AEP) and a set of generic quality screens (see Appendix M). Problems which are found by the nurse reviewers are passed on for further review by independent doctors, and then enter a committee based system of further review which eventually produces a judgement on the effect of the problem on the patient and the culpability of the doctor or hospital involved. MassPRO have found over a three year period that 72% of doctors have no quality problems; 15% have a single quality problem; 13% have 2 to 9 problems; and 0.5% have over 10 problems. A system of financial sanctions, intervention programmes, education, and ultimately deregistration deals with those doctors and hospitals who have recurring quality problems.

The PRO programme is controversial, and its contribution to the quality of care is not universally accepted. While it certainly encourages hospitals to have their own monitoring systems (so that they find out about problems and deal with them before the PRO does), it consumes an enormous amount of resources, and leads to an adversarial confrontation between hospitals and doctors on the one hand and the PRO on the other. In many states, the relationship between the PRO and the local hospitals is very poor. However, the PRO programme provides reassurance to the public and their elected representatives in Congress that the quality of care is being monitored, and that poor quality providers are being dealt with. It is therefore unlikely that the PRO programme will be stopped in the future, although its shape and aims may be modified.

4. A new approach to quality assurance

4.1 **Continuous quality improvement**

In section 2, the emphasis placed by the American quality assurance system on external inspection and regulation was noted, and attributed to the financial and organisational characteristics of the US healthcare system. In recent years, there has been a growing demand from healthcare providers, that the focus of quality assurance should be radically changed. Instead of adopting a model based on "policing" the healthcare industry, it has been suggested that a much more co-operative and participative approach should be employed, which acknowledges and builds on the desire for high standards and good practice which is common amongst clinical and non-clinical staff in hospitals.

The new approach is dubbed "continuous quality improvement" (CQI), and draws on the ideas of prominent American and Japanese theorists in the field of industrial quality assurance. Basically, CQI is a ground-up approach to QA, which relies heavily on the development of QA initiatives within hospitals, by teams of employees from a variety of professional backgrounds. CQI is currently very popular in the USA healthcare sector, and many hospitals are devoting considerable resources to training their senior and shop-floor staff in the ideas and practice of CQI. The JCAHO has adopted many of the ideas of CQI, and is trying to integrate them into its Agenda for Change programme.

It is difficult to establish how in practice CQI will change the quality assurance system in the USA, because much of the CQI philosophy is more concerned with management styles, organisational arrangements, and staff attitudes to QA than it is with methodologies or quantitative approaches. At worst, CQI might lead US hospitals to abandon some of the quantitative QA techniques they have developed, in favour of more qualitative approaches of less well proven value. More positively, it is to be hoped that CQI will lead US hospitals to deploy their formidable array of quantitative information much more imaginatively and positively than in the past, and develop a greater sense of ownership of the QA process amongst clinical staff.

5. Conclusions

5.1 **Learning from the USA experience**

At first, it can seem disheartening to observe that despite an enormous investment in quality assurance research and development (far greater than we could hope to make in the UK) the US healthcare system has not arrived at a consensus on the best approaches to QA, nor has it developed tools or techniques that are universally agreed to provide a good measure of the quality of care. However, it is probably fair to attribute the continually changing and developing QA systems and structures in the USA to a combination of the fundamental complexity of clinical medicine (which makes measuring the quality of care methodologically highly complex) and to a natural desire to improve and refine the techniques and approaches being used. In fact, both the successes and failures of the development of QA in the USA hold valuable lessons for the UK healthcare system.

Perhaps the most important lesson is that quality assurance must be participative, co-operative, and non-punitive - that using quality assurance as a regulatory or inspectorial mechanism fatally flaws the QA process. Any quality assurance programme must be supported by both providers and purchasers of care, and must be structured so that adversarial conflicts and semi-judicial assessments of culpability or responsibility are avoided. The current move in the USA away from an inspectorial model of quality assurance and towards continuous quality improvement supports this assertion.

The US experience shows that when QA systems are directly linked to financial incentives (such as the payment for individual cases) the quantitative techniques employed cannot easily resist distortion, through providers "gaming" the system. However, it also shows that providers show more than lip-service to quality assurance when they are given financial incentives to set up and maintain good quality assurance programmes. This suggests that general links between financial rewards and QA programmes are a positive force for quality assurance, although specific results-based links may not be.

The level of commercial competition among healthcare providers in the USA, and the degree of consumer choice, have certainly encouraged providers to develop and improve the quality of service they offer. In that sense, the free market has contributed towards higher standards of quality in healthcare. On the other hand, the free market structure has also led to enormous inequalities in access to healthcare services, and has encouraged the development of a very narrow perception of the quality of care.

One strength of the US QA system is its confidentiality. In almost every state, quality assurance data and proceedings are

protected from disclosure by statute. This gives clinical staff and hospitals the confidence to participate frankly in QA programmes without the fear that data will be disclosed to patients or competitors. At present, there is no equivalent legislation in the UK.

Finally, the US QA system has developed a number of tools and techniques which certainly have the potential to be applied in the NHS. Occurrence screening, comparative databases, and accreditation are all being tested in a variety of research projects and quality initiatives within the NHS. Other innovations such as the risk adjusted indexes and the International Classification of Clinical Services appear well worth piloting within the NHS. In each case, their successful application in the NHS environment will depend on how well they are adapted and changed to fit the very different organisational structures, incentive systems, and financial arrangements of the UK health service.

5.2 The future of quality assurance in the NHS

It seems certain that the quality assurance function within the NHS will develop on a smaller scale, with a more conservative use of resources, than its equivalent in the USA. Techniques developed in the USA will be adapted and changed to work in the NHS environment, though their more resource-intensive aspects are likely to be scaled down or omitted.

The widespread development of medical audit, initiated by the Department of Health in 1989 and encouraged by the provision of considerable financial resources, is likely to be the main vehicle for quality assurance in the NHS over the next one to two years. Because no specific methodology has been recommended by the Department of Health, hospitals are experimenting with a wide range of audit techniques, and this process should produce information on which approaches are most successful and relevant to the NHS.

However, the centrally funded medical audit initiative is unlikely to provide a long-term incentive to health authorities and hospitals to develop quality assurance systems. That will probably only be achieved through the structural reforms of the NHS, which will change the incentive systems and financial arrangements radically. Specifically, as the split between providers and purchasers of healthcare develops; as the contracting process for services becomes more meaningful; and as providers start to compete to win contracts from purchasers, the importance of quality assurance will grow. Quality assurance systems will be required, both as a control mechanism of provider behaviour in the managed market in healthcare, and as a tool for purchasers to use in contracting decisions.

Of course, it remains to be seen whether the NHS is able to develop quality assurance systems for use in the new managed market in healthcare without meeting the difficulties that the US healthcare system has encountered.

Appendix A

This appendix contains documentation of the occurrence screening process (including screening criteria and abstract forms) from Homewood Hospital in Baltimore.

Homewood Hospital Center, Inc.
Occurrence Screening Abstract

Discharge Date: _____
Primary D/C Diagnosis: _____

SIM Monitoring

Procedure	Date	Surgeon	Indications Met

Immediate Referral from UR Coordinator To_____ Date_____

Risk Management Reviewed ( ) Medico-Legal ( )
QR/UR/RM Director Reviewed ( )

For Routing to:

Medical Staff Monitoring	Medical Staff Dept.	Ancillary Review
( ) Blood Util.	( ) Anes.	( ) Nursing QA
( ) CCC	( ) Card.	( ) Dept. (spec)
( ) Inf. Cont.	( ) E.R.	_____
( ) Med. Rec.	( ) Medicine-MAC	( ) Other (spec)
( ) Mort.	( ) Path	_____
( ) P&T	( ) Psych	( ) Pt. Liaison
( ) RM	( ) Radiology	
( ) UR	( ) Surgery/Gyn-SCR	

CONFIDENTIAL - QUALITY REVIEW DEPARTMENT

	SCREENING ELEMENT		VARIATIONS
01	Readm it w/in 15 days due to adverse effects previous hospitalization	A D	
02	Admitted following OP surgery	M	
03	Admission note within 24 hrs		
04	H & P within 24 hrs	D	
05	Progress note every 48 hrs(post-op 24)	O	
06	Other documentation inadequacy	C	
07	Failure Test/Consult		
08	Delay Test/Consult	M	
09	Medical Complications of Tx	E	
10	Abnormal Results of Diag Test not Recognized	D I	
11	Misdiagnosis/Nondiagnosis	C	
12	Avoidable Repeat Test/Procedure	A	
13	Return to ICU/CCU w/in 24 hrs	L	****
14	Neuro Deficit/Organ Failure on d/c		
15	Cardiac/ resp. arrest		
16	Transfer of service not carried out		
17	No pre-anesthesia note	S	
18	Pt. returned from OR/ no procedure	U	
19	Adverse results of anesthesia	R	
20	Wrong Procedure/Patient/Body Part	G	
21	Laceration/Tear/Puncture of an Organ	I	
22	Unplanned Return to OR	C	
23	Post-op Complication	A	
24	MI/CVA w/in 48 hrs of surgery	L	
25	Consent absent/incomplete/incorrect		
26	Pre-Post Op Diag at Variance		
27	Tissue/Final Diag at Variance		
28	No post-anesthesia note		
29	Adverse drug reaction		
30	Incorrect Antibiotics	D	
31	No Diag Studies to Confirm Correct Drug	R U	
32	Serum drug levels not performed	G	
33	Fall		
34	Medication Irregularity	A	
35	Transfusion Reaction	D	
36	Nosocomial Infection	V	
37	Equipment Malfunction		
38	Other Patient Incident		
39	Transfer to Acute Care Facility		****
40	AMA (exclude detox)		
41	Unexpected Death		****
42	Death w/in 48 hrs post surgery	D	
43	Death w/in 24 hrs of ER adm	C	
44	No evidence of d/c teaching		
45	Discharge instructions not documented		
46	Dept/Other Problems Ext. LOS	O	
47	Nursing Care Issue	T	
48	Sig Family/Pt Complaints	H	
49	Other	E	
DATES: ICU_____CCU_____IMC_____		R	****

Appropriate Admission Y_____ N_____

Continued Stay above 7 days Y_____

Occurrence Screens

Procedure for Inpatient Review

1. Inpatient "occurrence" screening forms are initiated by the secretary each day by affixing inpatient registration stickers (white), received from the admitting office to blank inpatient occurrence screening forms. (attachment)

"Occurrence" screening forms are initiated for every patient admitted to the hospital within the preceding 24 hours (this excludes patients admitted to the North Campus.

2. The first concurrent review is done by the UR Coordinator within 24 to 72 Hours of admission.

3. Reviews are carried out as per the UR quidelines. All entries on the "occurrence screen" form should be dated.

4. Some circumstances may require immediate referral to the Patient Liaison, Risk Management, Chief of Service, Department Manager or Physician Advisor. Immediate referrals are generally required for:

a) an indicator for significant patient or family dissatisfaction
b) an indication for potential hospital liability
c) an indication of the possibility for management or correction of a problem on a concurrent basis.

Referrals can be made either by direct contact or with a "Physician Advisor Referral Form" (Attachment)
In either case the front of the occurrence screening form should be marked with the name of the contact person and the date of the referral. If a written referral is done a copy should be made to the occurrence screening form.

5. When the patient is discharges the UR Coordinator marks the front of the occurrence screening forms with the discharge date. All occurrence screens on discharged patients are placed in the Quality Review folder. The Risk Manager will retrieve the occurrence screen forms on a biweekly basis.

6. The Risk Manager reviews all occurrence screening forms after completion by the UR Coordinator for assessment for risk management concerns as may have been picked up during this first line review. Additionally the Risk Manager adds to the occurrence screening form any information (incident) which may contribute to a more complete QR review of the case.

7. After review by Risk Management the forms are then passed to the QR Coordinator for retrospective review.

8. The QR Coordinator will concentrate efforts on review of these cases.

9. The QR Coordinator reviews charts utilizing the inpatient occurrence screening criteria and the SIM screening criteria.

Note: Screening criteria/indicators are reviewed, updated and approved annually.

10. All reviews by the QR Coordinator are routed back to the Risk Manager to enable her to assess any Risk Management concerns as may have been picked up by the QR Coordinator.

11. All Reviews by the QR Coordinator must be completed by the 15th of the month following the month of the patient discharge from the hospital.

12. The Risk Manager then routes the screens to the QR Supervisor, who reviews and routes to the QR Director.

13. The QR Director reviews the documented occurrence screens and marks on the screen where the issue should be sent (committee, Chief, Department)

14. The screens are then given back to the QR Supervisor and held till the 15th of the month.
example: all July screens are held till August 15th to be sure are discharges have been reviewed.

15. The QR Supervisor will then sort the screens according to departments, committees, etc. She will them take a "Memorandum" for occurrence screen fall outs (attachment) and write down for each department the cases that fell out (had and incident). Those for Pharmacy and Therapeutics should be sent out first, followed by the other departments. Send these memorandum through the hospital mail. The contact person for the department is usually the person submitting 6 month reports to the Quality Review Board. (attachment)

16. Any screens for Surgery or Medicine are held for the committee's (Surgical Case Review Committee/Department of Medicine Quality Review Committee) preliminary meeting with the Chief/Chairman.

C O N F I D E N T I A L
HOMEWOOD HOSPITAL CENTER, INC.
QUALITY REVIEW DEPARTMENT
Memorandum

TO: _____

FROM: _____

DATE: _____

RE: OCCURRENCE SCREENING "FALL OUT"-- _____ /90

MEDICAL RECORD #	PATIENT'S NAME	ADM./DISCHG	SCREENING ELEMENTS	COMMMENTS

Appendix B

This appendix contains an example of the physician review reports produced by hospital quality assurance departments and used in physician credentialling. This report was produced by the Sisters of Mercy Health Service corporation, for a hospital in Ann Arbor.

THE GENERAL SURGERY REAPPOINTMENT PACKET INCLUDES:

1. Overall Summary
2. Reports
   - A. Resource Utilization Trends
   - B. Quality Assurance Report by Physician
   - C. List B Operation and Procedure Groups by Surgeon

REAPPOINTMENTS

SECTION OF GENERAL SURGERY

March 1990

Only physicians with an unfavorable (>10%) rating on select indices will be highlighted below. A yellow highlight will appear within the actual report.

I. Resource Utilization

Physician 1188 had an average LOS 16% greater than SJMH expected LOS. Costs were 15% greater than expected costs. Ancillary services were 22% greater than the SJMH expected ancillary usage with unfavorable ratios in Lab (1.11), Pharmacy (1.45), and Radiology (1.12).

Physician 1662 had an average LOS 12% greater than SJMH expected LOS.

Physician 1742 had an average LOS 530% greater than CPHA expected LOS and 537% greater than SJMH expected LOS. Costs were 378% greater than expected costs. Ancillary services were 296% greater than the SJMH expected ancillary usage with unfavorable ratios in Cardiology (1.45), Laboratory (6.84), Pharmacy (14.44), and Radiology (3.78).

Physician 2219 had an average LOS 21% greater than CPHA expected LOS and 17% greater than SJMH expected LOS.

Physician 4492 had an average LOS 17% greater than SJMH expected LOS. Costs were 25% greater than expected costs. Ancillary services were 33% greater than SJMH expected ancillary usage with unfavorable ratios in Cardiology (1.21), Laboratory (1.38), Pharmacy (1.36), and Radiology (1.28).

Physician 6776 had an average LOS 15% greater than CPHA expected LOS and 12% greater than SJMH expected LOS.

Physician 8138 had costs which were 15% greater than expected costs. Ancillary services were 23% greater than SJMH expected ancillary usage with unfavorable ratios in Cardiology (1.19), Laboratory (1.28), Pharmacy (1.25), and Radiology (1.11).

Physician 8332 had utilization of ancillary services that were 18% greater than SJMH expected ancillary usage. There were unfavorable ratios in Cardiology (1.22), Pharmacy (1.22), and Radiology (1.28).

Physician 9765 had an average LOS 77% greater than CPHA expected LOS and 80% greater than SJMH expected LOS. Costs were 47% greater than SJMH expected costs. Ancillary services usage was 27% greater than SJMH expected ancillary usage with unfavorable ratios in Pharmacy (1.53), and Radiology (1.84)

II. Quality Assurance

Physician 1789 had unfavorable readmission rates. The readmission rate within 15 days was 6.60 and within 30 days was 10.42.

Physician 2219 had an average LOS 20% greater than the expected CPHA LOS. This physician also had an unfavorable readmission rate of 10.29 within 15 days.

Physician 2820 had an unfavorable 15 day readmission rate of 5.15.

Physician 2994 had unfavorable readmission rates. The readmission rate within 15 days was 8.24. The readmission rate within 30 days was 10.86.

Physician 4110 had an unfavorable readmission rate of 6.04 within 15 days and 9.43 within 30 days.

Physician 4492 had fatality ratios which compared unfavorably within the specialty and within CPHA measurements. The fatality ratio was 1.29 when compared to the General Surgery specialty fatality rate and 1.17 when compared to the CPHA fatality rate.

Physician 5713 had an unfavorable readmission rate of 8.33 within 15 days.

Physician 6776 had an unfavorable readmission rate of 9.16 within 15 days.

Physician 7277 had a fatality ratio of 1.79 when compared to the General Surgery specialty fatality rate. The fatality ratio was also unfavorable when compared to CPHA data. This comparison was 1.67. An unfavorable readmission rate of 5.24 within 15 days and 7.66 within 30 days occurred for this physician.

Physician 8109 had an unfavorable readmission rate of 7.88 within 15 days.

Physician 8138 had a fatality ratio of 1.12 when compared to General Surgery specialty fatality rate.

Physician 8332 had an average LOS 34% greater than the General Surgery average LOS and 25% greater than the CPHA average LOS. The fatality ratio of 1.50 compared unfavorably to the General Surgery specialty rate. The readmission rate of 8.11 within 30 days was unfavorable.

Physician 9886 had an unfavorable readmission rate of 6.33 within 15 days.

III. List B Operation and Procedure Groups provide a more detailed picture of those discharges who had an operation or procedure. Only discharges with an operation or procedure are included in this report, therefore there will be a difference in a physicians's length of stay and fatality indicators when comparing the List B reports with the Quality Assurance or Resource Utilization Trends. The Quality Assurance and Resource Utilization reports use the DRG classification and more recent fatality (CY 87) and length of stay norms (CY) 87, while this report uses List B Operation and Procedure groups as the classification.

3/05/90

Resource Utilization Trends
Data Descriptions - Surgical Specialties

The trends are for fiscal years 1985 - 1989. The comparisons are case-mix adjusted. For example, when length of stay is compared to the CPHA ELOS the denominator has the average engths of stay for the same case-mix of DRGs as the numerator. All case-mix adjustments are made by using DRGs. When the denominator data is for SJMH, it embraces all discharges with the appropriate DRGs (including this specialty's discharges). When the denominator data is for the physician specialty (PHSP) it embraces all discharges (including this physician's discharges). The discharges for each physician are for those cases where this physician was the operating surgeon for the principal procedures. When a procedure was not performed, the discharge is given to that physician who discharged the patient (signed the face sheet).

Physician Group - Group numbers for physicians that practice as a group.

Physician Number - Randomly assigned physician number.

Discharges - Number of discharges.

Ave LOS - Average length of stay.

ALOS/CPHA ELOS - Average length of stay / case-mix adjusted CPHA, 1987, Northeast Central expected length of stay. (<1.00 favorable.)

ALOS/SJMH ELOS - Average length of stay / case-mix adjusted SJMH expected length of stay. (<1.00 favorable.)

ALOS/PHSP ELOS - Average length of stay / case-mix adjusted physician specialty expected length of stay. (<1.00 favorable.)

Ave Full Cost - The average estimated direct and indirect costs based on a ratio of cost to charges (RCC) in each cost center.

Cost/SJMH ECost - Estimated cost / case-mix adjusted SJMH expected estimated cost. (< 1.00 favorable.)

Pay/Cost - Total expected payment / total estimated costs. (>1.00 favorable.)

CMI - Case-mix Index. The average of the DRG weights.

ICU/SJMH ICU - ICU estimated costs / case-mix adjusted SJMH expected estimated costs. (< 1.00 favorable.)

Ancillary/SJMH Ancillary - The estimated costs for the ancillaries listed below / case-mix adjusted SJMH expected estimated costs for the same ancillaries. (<1.00 favorable.)

Cardio Pulm/SJMH ECardio Pulm - Cardio Pulmonary estimated costs / case-mix adjusted SJMH Cardio Pulmonary expected estimated costs. (<1.00 favorable.)

Laboratory/SJMH ELaboratory - Laboratory estimated costs / case-mix adjusted SJMH Laboratory expected estimated costs. (<1.00 favorable.)

Pharmacy/SJMH EPharmacy - Pharmacy estimated costs / case-mix adjusted SJMH Pharmacy expected estimated costs. (<1.00 favorable.)

Radiology/SJMH ERadiology - Radiology estimated costs / case-mix adjusted SJMH Radiology expected estimated costs. (<1.00 favorable.)

Physician Number(s)	Fiscal Years 1985 - 1987 Average	Fiscal Year 1988	Fiscal Year 1989
1188			
Discharges	186	190	199
Ave LOS	8.39	8.33	9.22
ALOS / CPHA ELOS	1.00	0.95	1.07
ALOS / SJMH ELOS	1.03	1.03	1.16
ALOS / PHSP ELOS	0.99	1.03	1.14
Ave Full Cost	$6,041	$8,109	$8,860
Cost / SJMH ECost	1.00	1.11	1.15
Pay / Cost	1.14	1.19	1.09
CMI	1.4902	1.6371	1.5355
ICU / SJMH E ICU	0.94	1.83	1.28
Ancillary/SJMH EAncillary	1.03	1.22	1.22
Cardio Pulm/SJMH ECardio Pulm	0.81	1.17	1.06
Laboratory / SJMH ELaboratory	0.99	1.17	1.11
Pharmacy / SJMH EPharmacy	1.23	1.35	1.45
Radiology / SJMH ERadiology	0.99	1.10	1.12
1662			
Discharges	218	192	254
Ave LOS	7.70	8.61	8.42
ALOS / CPHA ELOS	0.99	1.06	1.02
ALOS / SJMH ELOS	1.04	1.14	1.12
ALOS / PHSP ELOS	1.02	1.08	1.06
Ave Full Cost	$5,756	$7,701	$8,363
Cost / SJMH ECost	1.11	1.19	1.09
Pay / Cost	1.05	1.03	1.00
CMI	1.3459	1.5023	1.5545
ICU / SJMH E ICU	1.40	1.26	0.96
Ancillary/SJMH EAncillary	1.16	1.31	1.09
Cardio Pulm/SJMH ECardio Pulm	1.23	1.27	0.96
Laboratory / SJMH ELaboratory	1.14	1.32	1.06
Pharmacy / SJMH EPharmacy	1.18	1.31	1.18
Radiology / SJMH ERadiology	1.12	1.33	1.12
1742			
Discharges	166	134	1
Ave LOS	7.58	7.01	40.00
ALOS / CPHA ELOS	0.95	0.86	6.30
ALOS / SJMH ELOS	0.98	0.94	6.37
ALOS / PHSP ELOS	0.92	0.90	4.30
Ave Full Cost	$5,903	$6,273	$39,228
Cost / SJMH ECost	1.04	0.97	4.78
Pay / Cost	1.05	1.10	0.93
CMI	1.3999	1.4607	1.8911
ICU / SJMH E ICU	1.17	0.92	2.89
Ancillary/SJMH EAncillary	1.10	1.05	3.96
Cardio Pulm/SJMH ECardio Pulm	1.11	0.89	1.45
Laboratory / SJMH ELaboratory	1.05	1.02	6.84
Pharmacy / SJMH EPharmacy	1.18	1.15	14.44
Radiology / SJMH ERadiology	1.05	1.16	3.78

Physician Number(s)	Fiscal Years 1985 - 1987 Average	Fiscal Year 1988	Fiscal Year 1989
1789			
Discharges	258	303	289
Ave LOS	9.54	8.17	8.21
ALOS / CPHA ELOS	1.06	0.91	0.94
ALOS / SJMH ELOS	1.10	1.02	1.05
ALOS / PHSP ELOS	1.00	0.95	1.00
Ave Full Cost	$7,161	$7,413	$8,418
Cost / SJMH ECost	1.09	1.08	1.08
Pay / Cost	1.05	1.13	1.00
CMI	1.6055	1.5960	1.5613
ICU / SJMH E ICU	0.90	1.19	1.35
Ancillary/SJMH EAncillary	1.07	1.15	1.08
Cardio Pulm/SJMH ECardio Pulm	0.94	1.11	0.94
Laboratory / SJMH ELaboratory	1.12	1.21	1.11
Pharmacy / SJMH EPharmacy	1.14	1.12	1.09
Radiology / SJMH ERadiology	0.91	1.06	1.13
2219			
Discharges	256	294	300
Ave LOS	9.18	10.11	12.08
ALOS / CPHA ELOS	1.02	1.03	1.21
ALOS / SJMH ELOS	1.03	1.09	1.17
ALOS / PHSP ELOS	1.02	1.03	1.11
Ave Full Cost	$7,511	$9,122	$12,209
Cost / SJMH ECost	1.05	1.01	1.09
Pay / Cost	1.05	1.09	1.03
CMI	1.6410	1.8638	1.8876
ICU / SJMH E ICU	1.02	0.85	0.96
Ancillary/SJMH EAncillary	1.10	0.96	1.08
Cardio Pulm/SJMH ECardio Pulm	1.00	0.83	0.94
Laboratory / SJMH ELaboratory	1.05	0.95	1.07
Pharmacy / SJMH EPharmacy	1.13	1.00	1.17
Radiology / SJMH ERadiology	1.28	1.15	1.21
2693			
Discharges	155	61	0
Ave LOS	8.72	8.34	
ALOS / CPHA ELOS	0.91	0.78	
ALOS / SJMH ELOS	0.93	0.86	
ALOS / PHSP ELOS	0.90	0.83	
Ave Full Cost	$6,883	$7,281	
Cost / SJMH ECost	0.94	0.77	
Pay / Cost	1.13	1.31	
CMI	1.7263	2.0167	
ICU / SJMH E ICU	0.92	0.34	
Ancillary/SJMH EAncillary	0.93	0.71	
Cardio Pulm/SJMH ECardio Pulm	0.88	0.45	
Laboratory / SJMH ELaboratory	0.93	0.83	
Pharmacy / SJMH EPharmacy	0.96	0.69	
Radiology / SJMH ERadiology	0.96	0.76	

Physician Number(s)	Fiscal Years 1985 - 1987 Average	Fiscal Year 1988	Fiscal Year 1989
2820			
Discharges	96	110	103
Ave LOS	5.20	6.24	5.14
ALOS / CPHA ELOS	0.77	0.77	0.72
ALOS / SJMH ELOS	0.85	0.91	0.89
ALOS / PHSP ELOS	0.83	0.86	0.88
Ave Full Cost	$3,804	$4,245	$4,998
Cost / SJMH ECost	0.92	1.04	0.90
Pay / Cost	1.32	1.46	1.07
CMI	1.1698	1.4796	1.2461
ICU / SJMH E ICU	1.59	1.32	0.50
Ancillary/SJMH EAncillary	0.83	1.04	0.86
Cardio Pulm/SJMH ECardio Pulm	0.73	1.33	0.50
Laboratory / SJMH ELaboratory	0.81	0.91	0.86
Pharmacy / SJMH EPharmacy	0.82	1.01	0.83
Radiology / SJMH ERadiology	1.02	1.13	1.22
2994			
Discharges	242	269	288
Ave LOS	8.38	8.20	7.43
ALOS / CPHA ELOS	1.01	0.97	0.88
ALOS / SJMH ELOS	1.04	1.03	1.01
ALOS / PHSP ELOS	0.99	0.98	0.93
Ave Full Cost	$6,560	$7,057	$7,167
Cost / SJMH ECost	1.13	1.06	0.99
Pay / Cost	1.07	1.11	1.02
CMI	1.4348	1.5395	1.5158
ICU / SJMH E ICU	1.47	1.27	0.79
Ancillary/SJMH EAncillary	1.19	1.10	0.99
Cardio Pulm/SJMH ECardio Pulm	1.26	1.00	0.89
Laboratory / SJMH ELaboratory	1.27	1.09	0.93
Pharmacy / SJMH EPharmacy	1.10	1.15	1.11
Radiology / SJMH ERadiology	1.08	1.08	0.94
4110			
Discharges	279	264	296
Ave LOS	8.49	7.47	7.50
ALOS / CPHA ELOS	1.01	0.88	0.85
ALOS / SJMH ELOS	1.06	0.98	0.95
ALOS / PHSP ELOS	1.03	0.98	0.93
Ave Full Cost	$6,494	$6,587	$7,729
Cost / SJMH ECost	1.13	0.98	0.97
Pay / Cost	1.10	1.28	1.05
CMI	1.4758	1.6130	1.6169
ICU / SJMH E ICU	1.41	1.05	0.96
Ancillary/SJMH EAncillary	1.19	0.98	0.95
Cardio Pulm/SJMH ECardio Pulm	1.20	0.85	0.95
Laboratory / SJMH ELaboratory	1.23	1.02	1.02
Pharmacy / SJMH EPharmacy	1.14	0.93	0.87
Radiology / SJMH ERadiology	1.20	1.11	0.98

Physician Number(s)	Fiscal Years 1985 - 1987 Average	Fiscal Year 1988	Fiscal Year 1989
4492			
Discharges	217	317	301
Ave LOS	9.31	11.01	9.31
ALOS / CPHA ELOS	1.11	1.25	1.06
ALOS / SJMH ELOS	1.15	1.33	1.17
ALOS / PHSP ELOS	1.08	1.15	1.01
Ave Full Cost	$7,744	$9,215	$9,631
Cost / SJMH ECost	1.25	1.36	1.25
Pay / Cost	0.99	0.99	0.95
CMI	1.4702	1.5410	1.5337
ICU / SJMH E ICU	1.50	1.28	1.85
Ancillary/SJMH EAncillary	1.33	1.40	1.33
Cardio Pulm/SJMH ECardio Pulm	1.40	1.50	1.21
Laboratory / SJMH ELaboratory	1.33	1.44	1.38
Pharmacy / SJMH EPharmacy	1.31	1.38	1.36
Radiology / SJMH ERadiology	1.27	1.22	1.28
6776			
Discharges	228	257	281
Ave LOS	11.39	9.51	12.00
ALOS / CPHA ELOS	1.17	0.94	1.15
ALOS / SJMH ELOS	1.16	1.01	1.12
ALOS / PHSP ELOS	1.13	1.00	1.04
Ave Full Cost	$10,098	$10,143	$13,071
Cost / SJMH ECost	1.20	1.04	1.06
Pay / Cost	1.04	0.96	0.98
CMI	1.8250	1.9958	2.1065
ICU / SJMH E ICU	1.33	1.10	0.88
Ancillary/SJMH EAncillary	1.21	1.03	1.02
Cardio Pulm/SJMH ECardio Pulm	1.23	0.83	0.80
Laboratory / SJMH ELaboratory	1.12	1.07	1.05
Pharmacy / SJMH EPharmacy	1.23	1.02	1.10
Radiology / SJMH ERadiology	1.42	1.30	1.24
7277			
Discharges	170	229	265
Ave LOS	8.22	7.88	7.58
ALOS / CPHA ELOS	0.96	0.84	0.81
ALOS / SJMH ELOS	1.00	0.93	0.92
ALOS / PHSP ELOS	0.95	0.89	0.85
Ave Full Cost	$6,197	$7,155	$7,391
Cost / SJMH ECost	1.02	0.94	0.90
Pay / Cost	1.11	1.17	1.02
CMI	1.5435	1.7130	1.6807
ICU / SJMH E ICU	1.14	0.70	0.54
Ancillary/SJMH EAncillary	1.03	0.95	0.87
Cardio Pulm/SJMH ECardio Pulm	1.00	0.96	0.66
Laboratory / SJMH ELaboratory	1.08	0.95	0.90
Pharmacy / SJMH EPharmacy	1.06	0.97	0.91
Radiology / SJMH ERadiology	0.86	0.95	0.89

Physician Number(s)	Fiscal Years 1985 - 1987 Average	Fiscal Year 1988	Fiscal Year 1989
8109			
Discharges	199	202	195
Ave LOS	8.07	6.69	7.28
ALOS / CPHA ELOS	0.95	0.83	0.85
ALOS / SJHH ELOS	1.01	0.92	0.91
ALOS / PHSP ELOS	0.96	0.86	0.89
Ave Full Cost	$5,849	$5,827	$6,758
Cost / SJHH ECost	1.01	0.90	0.87
Pay / Cost	1.14	1.25	1.06
CMI	1.5741	1.5355	1.5867
ICU / SJHH E ICU	1.01	0.79	0.62
Ancillary/SJHH EAncillary	1.02	0.85	0.83
Cardio Pulm/SJHH ECardio Pulm	0.98	0.84	0.77
Laboratory / SJHH ELaboratory	1.02	0.85	0.80
Pharmacy / SJHH EPharmacy	1.01	0.86	0.86
Radiology / SJHH ERadiology	1.05	0.81	0.89
8138			
Discharges	203	223	236
Ave LOS	8.70	9.84	9.18
ALOS / CPHA ELOS	1.02	1.12	0.98
ALOS / SJHH ELOS	1.04	1.22	1.06
ALOS / PHSP ELOS	1.00	1.17	1.01
Ave Full Cost	$6,368	$8,052	$10,151
Cost / SJHH ECost	1.04	1.16	1.15
Pay / Cost	1.05	1.12	0.99
CMI	1.5153	1.5922	1.7549
ICU / SJHH E ICU	0.97	0.88	1.34
Ancillary/SJHH EAncillary	1.07	1.13	1.23
Cardio Pulm/SJHH ECardio Pulm	1.00	0.81	1.19
Laboratory / SJHH ELaboratory	1.06	1.14	1.28
Pharmacy / SJHH EPharmacy	1.12	1.27	1.25
Radiology / SJHH ERadiology	1.07	1.03	1.11
8332			
Discharges	102	95	91
Ave LOS	8.35	6.26	6.54
ALOS / CPHA ELOS	1.05	0.83	0.87
ALOS / SJHH ELOS	1.07	0.94	0.96
ALOS / PHSP ELOS	1.02	0.96	0.93
Ave Full Cost	$6,096	$5,754	$7,080
Cost / SJHH ECost	1.11	1.08	1.08
Pay / Cost	1.12	1.22	1.10
CMI	1.3716	1.3238	1.3471
ICU / SJHH E ICU	1.00	1.50	1.17
Ancillary/SJHH EAncillary	1.11	1.28	1.18
Cardio Pulm/SJHH ECardio Pulm	1.10	1.16	1.22
Laboratory / SJHH ELaboratory	1.06	1.27	1.08
Pharmacy / SJHH EPharmacy	1.21	1.31	1.22
Radiology / SJHH ERadiology	1.03	1.34	1.28

Physician Number(s)	Fiscal Years 1985 - 1987 Average	Fiscal Year 1988	Fiscal Year 1989
8583			
Discharges	142	36	0
Ave LOS	9.32	6.47	
ALOS / CPHA ELOS	1.07	0.77	
ALOS / SJHH ELOS	1.10	0.87	
ALOS / PHSP ELOS	1.05	0.89	
Ave Full Cost	$5,913	$4,893	
Cost / SJHH ECost	0.98	0.81	
Pay / Cost	1.12	1.21	
CMI	1.4950	1.4474	
ICU / SJHH E ICU	0.75	0.49	
Ancillary/SJHH EAncillary	0.89	0.70	
Cardio Pulm/SJHH ECardio Pulm	0.82	0.67	
Laboratory / SJHH ELaboratory	0.86	0.78	
Pharmacy / SJHH EPharmacy	0.95	0.71	
Radiology / SJHH ERadiology	0.98	0.45	
9765			
Discharges	99	59	30
Ave LOS	8.68	8.51	11.93
ALOS / CPHA ELOS	1.22	1.21	1.77
ALOS / SJHH ELOS	1.21	1.41	1.80
ALOS / PHSP ELOS	1.09	1.26	1.58
Ave Full Cost	$4,592	$5,430	$8,859
Cost / SJHH ECost	1.06	1.23	1.47
Pay / Cost	1.16	1.18	0.87
CMI	1.2391	1.1520	1.2164
ICU / SJHH E ICU	0.71	0.68	0.33
Ancillary/SJHH EAncillary	0.84	1.04	1.27
Cardio Pulm/SJHH ECardio Pulm	0.74	0.87	0.68
Laboratory / SJHH ELaboratory	0.78	0.97	1.01
Pharmacy / SJHH EPharmacy	0.95	1.20	1.53
Radiology / SJHH ERadiology	0.84	0.97	1.84
9886			
Discharges	107	113	85
Ave LOS	5.50	4.81	5.80
ALOS / CPHA ELOS	0.78	0.69	0.88
ALOS / SJHH ELOS	0.85	0.79	0.92
ALOS / PHSP ELOS	0.87	0.83	0.89
Ave Full Cost	$3,571	$3,623	$5,439
Cost / SJHH ECost	0.77	0.74	0.89
Pay / Cost	1.32	1.11	1.17
CMI	1.2405	1.2519	1.2198
ICU / SJHH E ICU	0.32	0.28	0.87
Ancillary/SJHH EAncillary	0.67	0.63	0.82
Cardio Pulm/SJHH ECardio Pulm	0.50	0.37	0.56
Laboratory / SJHH ELaboratory	0.57	0.62	0.81
Pharmacy / SJHH EPharmacy	0.74	0.71	0.85
Radiology / SJHH ERadiology	1.00	0.71	1.16

Physician Number(s)	Fiscal Years 1985 - 1987 Average	Fiscal Year 1988	Fiscal Year 1989

Notes:

I. ERR message - denominator is zero.

II. Data Sources:

A. SJHH Data
COMPASS, FIN85, Updated 12-01-86
FIN86, Updated 12-01-86
FIN87, Updated 10-12-87
FIN88, Updated 12-03-88
FIN89, Updated 2-05-90

B. LOS Comparison Data (ELOS)
1. CPHA FY 1985 National Norms used for FY 1985 through FY 1987 comparisons.
2. CPHA CY 1987 Northeast Central Norms used for FY 1988 comparisons.

03/05/90

Quality Assurance Report Data Descriptions
Surgical Specialties/Departments

The quality assurance comparisons are case-mix adjusted using DRGs. The surgeon credited with the discharge is the one who performed the principal operation or procedure. If an operation or procedure was not performed, then the physician who has signed the face sheet is credited with the discharge.

PHYS # - Randomly assigned physician number.

DISCH - Number of discharges.

ALOS - Average length of stay.

ALOS/SPEC - A ratio of the average length of stay for patients discharged by this physician to the case-mix adjusted average length of stay for this specialty/department (less than 1.00 favorable).

ALOS/CPHA - A ratio of the average length of stay for patients discharged by this physician to the case-mix adjusted expected length of stay based on CPHA, FY 1987, Northeast Central data (less than 1.00 favorable).

% 90_TILE - The percentage of patients discharged by this physician with a length of stay which exceeds the 90th percentile length of stay, CPHA, FY 1987, Northeast Central data.

 # DIED - Number of patients that died during their stay.

DTHS/SPEC - A case-mix adjusted ratio of the percentage of deaths to the percentage of deaths for all discharges within this specialty (less than 1.00 favorable).

DTHS/CPHA - A case-mix adjusted ratio to the percentage of deaths to the percentage of expected deaths based on CPHA 1987, Northeast Central data (less than 1.00 favorable).

% READM 15 - Percentage of discharges readmitted within 15 days. (This does not include the day of admission or discharge).

% READM 30 - Percentage of discharges readmitted within 30 days. (This does not include the day of admission or discharge).

RE 15/SPEC - A ratio of the number of readmissions within 15 days to the number of readmissions expected within 15 days based on case-mix adjusted readmission rate for this specialty/department (less than 1.00 favorable).

RE 30/SPEC - A ratio of the number of readmissions within 30 days to the number of readmissions expected within 30 days based on case-mix adjusted readmission rate for this specialty/department (less than 1.00 favorable).

/rk
REP-QADD

QUALITY ASSURANCE REPORT
CALENDAR YEAR 1989
GENERAL SURGERY

'HYS#	DISCH	ALOS	ALOS/SPEC	ALOS/CPHA	%90_TILE	#DIED	DTHS/SPEC	DTHS/CPHA	%READM15	%READM30	RE15/SPEC	RE30/SPEC
1188	184	9.49	1.06	1.05	10.33	6	0.91	0.96	3.80	7.07	0.70	0.80
1662	229	7.97	1.00	0.94	8.30	5	0.85	0.64	4.37	6.99	0.74	0.82
1789	288	7.02	0.92	0.83	7.64	6	1.02	0.74	6.60	10.42	1.22	1.20
2219	272	12.26	1.09	1.20	16.54	12	1.03	0.88	10.29	13.97	1.28	1.05
2379	97	9.04	1.10	1.06	13.40	3	0.97	0.63	2.06	5.15	0.33	0.56
2693	1	9.00	0.65	0.62	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
2820	97	4.88	0.73	0.63	3.09	1	0.46	0.49	5.15	6.19	1.18	1.09
2994	267	7.57	0.95	0.91	12.36	7	0.84	0.74	8.24	10.86	1.53	1.42
4110	265	7.86	0.96	0.91	10.57	6	0.80	0.73	6.04	9.43	1.11	1.13
4492	241	9.94	1.06	1.12	17.01	12	1.29	1.17	4.56	11.20	0.70	1.10
5713	24	8.21	0.83	0.80	8.33	1	1.11	1.08	8.33	8.33	1.27	0.83
6776	273	12.30	1.08	1.19	16.12	13	1.18	1.02	9.16	12.82	1.15	0.97
7277	248	7.95	0.96	0.90	8.06	13	1.79	1.67	5.24	7.66	1.17	1.15
8109	203	7.43	0.90	0.85	7.88	6	1.03	0.91	7.88	9.85	1.34	1.02
8138	214	8.92	0.96	0.96	12.62	10	1.12	1.08	4.21	7.01	0.82	0.90
8332	74	9.69	1.34	1.25	16.22	2	1.50	0.90	2.70	8.11	0.90	1.53
9886	79	5.92	0.77	0.77	5.06	0	0.00	0.00	6.33	6.33	1.12	0.78
VG:		8.81			11.39				6.28	9.52		
TOTAL:	3056					103						

JRCE: COMPASS SJFIS88, SJFIS89 (UPDATED 3/05/90) MYRA C. DAOUD
ILD_Q1,QSAYY/P,QSAYY/PRUN,RG_QSAYY/P,T_QSAYY/P

3/05/90

LIST B OPERATION AND PROCEDURE GROUPS BY PHYSICIAN

Data Descriptors

PHYS_# - Randomly assigned physician number (surgeon performing the principal procedure)

LIST_B - List B Hospital Operation and Procedure Groups

DISCH - Number of discharges

SPEC_DISCH - Number of discharges for the entire specialty

ALOS - Average length of stay

ALOS/CPHA - A ratio of the average length of stay for the CPHA 1987 (National) age category matched expected length of stay

CPHA_ELOS - CPHA 1987 (National) age category matched expected length of stay

ALOS/SPEC - A ratio of the average length of stay to the physician specialty expected length of stay

SPEC_ELOS - Physician specialty expected length of stay

#_DIED - Number of patients that died during this hospital stay

SPEC_DIED- Number of patients that died in this category for the entire specialty

EDTHS - Expected number of deaths using the CPHA 1981 National fatality rates; age category matched

DTHS/EDTHS - A ratio of the number of deaths to the expected deaths (CPHA 1981 National norms)

/rk
REP-REAP-1

PHYSICIAN SPECIFIC LIST B OPERATION AND PROCEDURE GROUPS - JANUARY 1988 - DECEMBER 1989 -- SJMH INPATIENT

1 SPECIALTY	PHYS_#	LIST_B	DESCRIPTION								
2	#DISCH	SPEC_DISCH	AVE_LOS	ALOS/CPHA_ELOS	CPHA_ELOS	ALOS/SPEC_ELOS	SPEC_ELOS	#DIED	SPEC_DIED	EDTHS	DTHS/EDTHS
1 GEN_SURG	1188	513	THYROIDECTOMY								
2	8	121	3.62	1.07	3.40	1.65	2.20	0	0	0.016	0.000
1		514	OPERAT ON PARATHY & THYROID EXCEPT THYROIDECTOMY								
2	1	18	4.00	0.54	7.40	0.88	5.89	0	0	0.009	0.000
1		552	OP ON TNG/ORL CAV/FAC REG EX PLTPLST& OP ON SAL GL								
2	1	3	13.00	2.41	5.40	2.44	5.33	0	0	0.008	0.000
1		569	THORACOTOMY								
2	1	17	18.00	2.47	7.30	2.25	8.00	0	1	0.116	0.000
1		577	LIGATION/STRIPPING OF VARICOSE VEINS								
2	4	17	3.25	1.22	2.68	0.99	3.29	0	0	0.000	0.000
1		578	SYSTEMIC SHUNT OR GRAFT BYPASS								
2	10	269	8.10	0.64	12.71	0.51	15.91	0	15	0.560	0.000
1		581	OTHER OPERATIONS ON BLOOD VESSELS								
2	25	828	8.44	0.88	9.58	0.83	10.13	1	42	2.500	0.400
1		582	INCISION, EXCISION OF LYMPHATIC STRUCTURES								
2	1	38	7.00	0.99	7.10	0.52	13.53	0	2	0.029	0.000
1		586	MISCELLANEOUS OPERATION ON SPLEEN/ BONE MARROW								
2	1	39	14.00	1.23	11.40	1.03	13.54	0	1	0.071	0.000
1		587	OTH DIAG/THER PROC ON VESSELS/LYMPH STRUCT/SPLEEN								
2	4	170	6.75	0.52	13.05	0.38	17.78	0	21	1.104	0.000
1		589	ESOPHAGOSCOPY/GASTROSCOPY (NATURAL ORIFICE)								
2	4	7	4.25	4.72	0.90	1.29	3.29	0	0	0.100	0.000
1		591	GASTROSTOMY								
2	1	55	88.00	4.54	19.40	3.59	24.53	1	6	0.214	4.673
1		593	PARTIAL GASTRECTOMY								
2	1	32	12.00	0.78	15.40	0.88	17.53	0	2	0.077	0.000
1		595	VAGOTOMY								
2	2	28	8.50	0.75	11.35	0.64	13.31	0	0	0.076	0.000
1		598	MISCELLANEOUS OPERATIONS ON STOMACH								
2	7	54	18.14	1.88	9.67	1.04	17.50	0	5	0.441	0.000
1		597	LOC EXCIS OR DESTRUC OF INTESTLESION OR TISSUE								
2	8	23	8.37	1.13	7.39	1.22	6.87	0	1	0.120	0.000
1		598	RESECTION OF SMALL INTESTINE								
2	1	92	30.00	2.08	14.40	1.57	19.14	0	11	0.136	0.000
1		599	COLECTOMY								
2	27	358	23.19	1.70	13.65	1.63	14.24	2	19	1.593	1.255
1		600	OTHER INCISION/RESECTION OF INTESTINE								
2	1	13	18.00	1.03	17.40	1.18	15.31	0	2	0.128	0.000
1		601	INTESTINAL ANASTOMOSIS OR REPAIR								
2	5	70	10.00	0.78	12.90	0.85	11.77	0	3	0.210	0.000

NOTE: THE FOLLOWING LIST B OP/PROC GROUPS DO NOT HAVE A CPHA EXPECTED LOS: 512,589,629,659,741,752,759,763
THE EXPECTED LOS HAS BEEN ARTIFICIALLY SET AT 0.9 SO AS NOT TO GENERATE PROGRAM ERRORS WHEN PROCESSING THE REPORTS

SOURCE: COMPASS STJOE88,SJFIS89,SJFIS90 (UPDATED 3/5/90) MYRA DAOUD (572-2452) SFNM:PHYS.OPS,REAP_RN_GS,REAP_RG_GS,T_REAP

PHYSICIAN SPECIFIC LIST B OPERATION AND PROCEDURE GROUPS - JANUARY 1988 - DECEMBER 1989 -- SJMH INPATIENT

1 SPECIALTY	PHYS_#	LIST_B	DESCRIPTION								
2	#DISCH	SPEC_DISCH	AVE_LOS	ALOS/CPHA_ELOS	CPHA_ELOS	ALOS/SPEC_ELOS	SPEC_ELOS	#DIED	SPEC_DIED	EDTHS	DTHS/EDTHS
1		802	ILEOSTOMY/COLOSTOMY/OTHER ENTEROSTOMY								
2	4	31	11.50	0.83	18.18	0.57	20.00	0	5	0.720	0.000
1		803	APPENDECTOMY								
2	27	471	3.59	0.80	4.50	0.90	4.01	0	0	0.054	0.000
1		806	LOC EXCIS OR DESTRUC OF LESION OR TISSUE OF RECTUM								
2	2	33	2.00	0.35	5.70	0.50	3.97	0	0	0.032	0.000
1		807	OTH INCIS RECTUM/INCIS OR EXCIS OF PERIRECT TISS								
2	2	28	5.50	1.15	4.80	1.00	5.50	0	0	0.012	0.000
1		808	PROCTECTOMY								
2	5	82	18.60	1.24	15.00	1.48	12.77	0	1	0.205	0.000
1		809	MISCELLANEOUS OPERATIONS ON INTESTINE								
2	5	44	8.80	0.91	7.28	1.13	5.88	0	1	0.100	0.000
1		810	INCISION OR EXCISION OF ANAL FISTULA								
2	1	7	4.00	1.67	2.40	1.33	3.00	0	0	0.000	0.000
1		812	HEMORRHOIDECTOMY								
2	4	24	3.50	1.13	3.10	1.15	3.04	0	0	0.004	0.000
1		813	MISCELLANEOUS OPERATIONS ON ANUS								
2	1	29	5.00	1.35	3.70	1.42	3.52	0	0	0.007	0.000
1		816	CHOLECYSTECTOMY								
2	34	780	8.12	0.84	7.28	1.08	5.78	0	7	0.374	0.000
1		817	OPER ON BILIARY TRACT/GALLBLAD EXC CHOLECYSTECTOMY								
2	3	39	18.67	1.48	12.80	1.18	15.85	0	2	0.282	0.000
1		818	OPERATIONS ON PANCREAS								
2	2	30	78.00	5.78	13.50	3.04	25.70	2	3	0.114	17.544
1		819	MISC DIAG/THERPROC/DIGES TRT/ ABDOMINAL CAV & WALL								
2	1	8	2.00	0.32	6.20	0.21	9.37	0	0	0.010	0.000
1		820	UNILATERAL REPAIR OF INGUINAL HERNIA								
2	8	75	2.50	0.80	3.13	0.76	3.29	0	2	0.012	0.000
1		821	BILATERAL REPAIR OF INGUINAL HERNIA								
2	3	11	2.00	0.67	3.00	0.88	2.27	0	0	0.003	0.000
1		822	UNILATERAL OR BILAT REPAIR OF FEMORAL HERNIA								
2	1	9	2.00	0.31	6.40	0.29	6.78	0	0	0.012	0.000
1		823	REPAIR OF UMBILICAL HERNIA								
2	2	15	4.00	1.33	3.00	1.10	3.40	0	0	0.010	0.000
1		824	REPAIR OF OTH HERNIA OF ANTERIOR ABDOM WALL								
2	12	108	5.33	1.05	5.09	1.12	4.76	0	0	0.060	0.000
1		828	INCIS/EXCIS OF ABDOM WALL/PERITON EXC LAPAROTOMY								
2	4	68	8.25	0.88	9.43	0.89	9.25	0	3	0.472	0.000
1		827	LAPAROTOMY								

NOTE: THE FOLLOWING LIST B OP/PROC GROUPS DO NOT HAVE A CPHA EXPECTED LOS: 512,589,629,659,741,752,759,783
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SOURCE: COMPASS STJOE88,SJFIS89,SJFIS90 (UPDATED 3/5/90) MYRA DAOUD (572-2452) SFNM:PHYS.OPS,REAP_AN_GS,REAP_AG_GS,T_REAP

PHYSICIAN SPECIFIC LIST B OPERATION AND PROCEDURE GROUPS - JANUARY 1988 - DECEMBER 1989 -- SJMH INPATIENT

1 SPECIALTY	PHYS_#	LIST_B	DESCRIPTION	#DISCH	SPEC_DISCH	AVE_LOS	ALOS/CPHA_ELOS	CPHA_ELOS	ALOS/SPEC_ELOS	SPEC_ELOS	#DIED	SPEC_DIED	EDTHS	DTHS/EDTHS
2				9	125	20.22	1.70	11.88	1.67	12.14	1	23	0.846	1.182
1		629	PERITONEAL DIALYSIS											
2				1	2	2.00	2.22	0.90	0.44	4.50	0	0	0.088	0.000
1		630	MISCELLANEOUS OPERAT ON ABDOM WALL/ PERITONEUM											
2				7	132	10.86	1.06	10.27	0.85	12.73	0	4	0.329	0.000
1		681	UNILAT OOPHORECTOMY OR SALPINGO-OOPHORECTOMY											
2				1	3	4.00	0.78	5.10	0.60	6.67	0	0	0.001	0.000
1		682	BILAT OOPHORECTOMY OR SALPINGO-OOPHORECTOMY											
2				1	1	12.00	1.62	7.40	1.00	12.00	0	0	0.005	0.000
1		727	EXCIS OF LESION OF MUSCLE/TENDON/ FASCIA/BURSA											
2				2	21	11.50	1.83	6.30	1.33	8.62	0	2	0.008	0.000
1		734	AMPUTATION OF TOES											
2				3	49	24.67	1.85	15.00	1.99	12.39	0	0	0.078	0.000
1		735	BELOW-KNEE AMPUTATION											
2				5	48	22.80	1.11	20.62	1.02	22.33	1	4	0.430	2.326
1		736	ABOVE-KNEE AMPUTATION											
2				8	32	10.75	0.59	18.28	0.44	24.31	0	8	1.280	0.000
1		742	LOCAL EXCIS OR DESTRUC OF LESION OF BREAST											
2				2	173	3.00	1.03	2.90	0.90	3.34	0	1	0.006	0.000
1		744	EXTEND SIMPLE MASTECT/RADICAL MASTECTOMY											
2				12	254	5.50	1.03	5.37	1.47	3.75	0	0	0.012	0.000
1		748	INCIS/EXCIS OF PILONIDAL CYST OR SINUS											
2				1	3	2.00	0.87	2.30	0.86	2.33	0	0	0.000	0.000
1		748	OTH INCIS/EXCIS/SUTURE OF SKIN											
2				14	162	7.64	0.71	10.76	0.70	10.89	0	6	0.252	0.000
WT.AVG:														
2						10.34		8.97		9.54				
TOTAL:														
2				298	4923						8	203	13.326	

NOTE: THE FOLLOWING LIST B OP/PROC GROUPS DO NOT HAVE A CPHA EXPECTED LOS: 512,589,629,659,741,752,759,763
THE EXPECTED LOS HAS BEEN ARTIFICIALLY SET AT 0.9 SO AS NOT TO GENERATE PROGRAM ERRORS WHEN PROCESSING THE REPORTS

SOURCE: COMPASS STJOE88,SJFIS89,SJFIS90 (UPDATED 3/5/90) MYRA DAOUD (572-2452) SFNM:PHYS.OPS,REAP_RN_GS,REAP_RG_GS,T_REAP

Appendix C

This appendix contains the procedure notes for the surgical case review committee of Homewood Hospital in Baltimore. It illustrates the complex committee review system in place to review and make judgements on occurrences identified during occurrence screening.

Surgical Case Review Committee

The Surgical Case Review Committee meets the 2nd Monday of the month.

Before the meeting several processes occur.et data.)

Before meeting:

1. The inpatient "Occurrence Screens" from 2 month prior, which had been routed by the Quality Assurance Director to the department of surgery, are held by the Quality Assurance Supervisor for the preliminary meeting with the Chief of Surgery 2 weeks before the committee meeting.

2. The QRS will put all cases up for review on a worksheet "HHC-Surgical Case Review Report" (attachment), with a copy for the Chief of Surgery.
Listed on the form will be the inpatient surgery and gyn cases.

Also held for this preliminary meeting are the following:
a) those cases found during the "OR Log" process - over 5 hour, cases that should have had tissue, procedures that didn't match the diagnosis
b) any admissions from the PACU (attachment)
c) those 'scope' screens that didn't meet criteria (attachment)
d) any outpatient occurrence screens that had been randomly picked and reviewed

Preliminary meeting:

1. Charts are not needed during the preliminary meeting (call for an appointment with the Chief of Surgery).
2. Take a copy of worksheet, which is a rough draft of the form "HHC-Surgical Case Review Report" for Chief.
3. Take occurrence screens inpatient
4. Take occurrence screens outpatient that fell on random review.
5. Take 'scope' screens that fell out on review.
6. Take copies of OR Data Records that fell out during OR Log Process.
7. Discuss the cases with the Chief of Surgery for elimination or review.
8. Those cases selected will be placed on the form "HHC Surgical Case Review Report" with the conclusion column blank.
9. Case eliminated will be placed on a similar form but it will have "eliminated cases" under the title. The conclusion column is filled in with the Chief's comments.
10. Letters may be generated by these cases. The cases that fell out from the OR process will be placed on the form called "HHC Surgical Case Review-Pathologist Report", if tissue was not taken and should of or the tissue sent was normal.

11. These forms and letters will be typed by the QA secretaries.
12. Fill out the "Abstractor's Report" which is for your own personal benefit, and to be read at the committee meeting. (attachment)
13. The agenda will also be discussed, and any response letters received, which were generated from the previous meeting. The agenda will be typed by the Chief's secretary. She will mail out the minutes from the last meeting to the members, with a reminder for the meeting coming up.
14.Fill out the form "HHC Surgical Case Review Report" for those cases that were selected by the Chief.
15. Those cases eliminated are placed on the same form but it states in ( ) that cases are eliminated.
16. Those cases that were without tissue or normal will be placed on the Chief Pathologists form "HHC Surgical Case Review-Pathologist Report"

After this meeting:

1. Take the blank "Occurrence Screens", that were held, from 2 months prior and randomly pick 20 surgical cases and 10 gyn cases for clinical pertinence (quality of the chart documentation), which the doctors do at the meeting.
2. Fill out the form "Medical Staff Medical Record Clinical Pertinence Review Worksheet" (attachment) for those 30 cases.
3. Also fill our the form "Surgical Case Review Worksheet" (attachment) for those cases selected for review.
4. Fill out the "Medical Records Requisition" form (attachment) for the all the charts a week before. It is best to give this pile of requisitions to the Medical Record Assistant Director, to be sure charts are pulled for that day
5. A day before check to see if the charts are at Medical Records. For clinical pertinence only 20 charts out of the 30 need to be present - but all would be good too.

The day of Committee:

1. The day of the Surgical Case Review Committee pull the charts and take them to the lecture hall.
2. Place the worksheets in the charts (for Clinical Pertinence and the chart worksheet). The OR cases for the Pathologist does not have worksheets. The "HHC-Surgical Case Review Committee - Pathologists Report" is for the pathologist only.
3. Make 15 copies of the forms, for eliminated cases, reviewed and agenda. Pass out.
4. During the meeting give charts for review to Chief of Surgery to disperse to specific doctors.
5. The OR cases go directly to the Chief of Pathology, with your south campus report on form "HHC Surgical Case Review Committee - Pathologist Report", which looks different from her form, (attachment) that she makes out for both campus. When she reports from her form, issues may arise that the committee may want to

review for the next meeting. Letters may be also generated from her report.
6. Clinical Pertinence charts are divided up among the doctors.
7. Keep notes even though the Chief of Surgery's secretary does.
8. Have "Occurrence Screens" handy for those cases being reviewed and copies of the "OR Data Record" for the Pathologist.
9. Response letters from doctors, from previous the meeting, should be in front of the Chief of Surgery for his reference.

After the Committee:

1. After the meeting write up the minutes, memos and letters generated from the review of case and the pathologist's review. Use the "Surgical Case Review Committee" form letter.
2. The Chief Pathologist will give you a copy of her report of the north and south campus on the form "HHC Surgical Case Review Committee - Pathologist Report", which looks different from your report but has the same name. After the meeting her two forms are filed in the SCR binder.
3. The QA secretaries will type up the reviewed cases with the conclusion column filled in, and the pathologist report with the "justified column" filled in. (The pathologist report must be signed by the Pathologist before it can be filed in the SCR binder.
4. The minutes and letters can be typed by the Chief of Surgery's secretary, and signed later by the chief. (Be sure to get copies of the minutes and letters before she sends them out) All letters generated, forms filled out, and minutes should be filed in the SCR binder.

SCR

Information Prepared for Peer Review - CONFIDENTIAL

HOMEWOOD HOSPITAL CENTER, INC.
Surgical Case Review Worksheet

Service: _____
Med. Red. #: _____
Adm: _____ D/C: _____
Procedure: _____
Surgeon: _____

I. Review is warranted on the basis of: (check all applicable)

___Failure to meet Surgical Indications Monitoring Criteria
___Failure of pathology diagnosis to confirm pre-operative diagnosis
___Normal tissue removed that was not anticipated
___Mortality (within 72 hrs. of an operative procedure)
___Complication
- ___Infection
- ___Hemorrhage
- ___Obstruction
- ___Dehiscence
- ___Thromboembolic problem
- ___Herniation, post-operative
- ___Neurologic deficit, new
- ___Other (specify) _____

___ Occurrence Screen Fallout:

- ___Readmission within 15 days as a result of complications of surgery/treatment received during previous admission
- ___Patient admitted following outpatient surgery
- ___Avoidable surgical cancellation
- ___Wrong procedure/wrong patient/wrong site
- ___Operation for perforation, laceration, tear, puncture, or other injury incurred during an invasive procedure
- ___Unplanned removal, or injury requiring repair, or an organ or part of an organ during an operative procedure
- ___Unplanned return to the operating room during the same admission
- ___Myocardial infarction during or within 48 hours of an operative procedure

___Documentation Fallout

- ___Inadequate surgical consent
- ___Tranfer of service required but not carried out
- ___Lack of admission note
- ___Lack of history and physical prior to surgery
- ___Lack of post-operative progress note within 24 hrs. of surgery
- ___Lack of attending progress notes every 48 hrs.

___Other

II. Review of the case reveals that:

___The indications (criteria) for performing the surgery were met
___Despite the apparent patient care problem, the clinical practice is acceptable (score 1)
___Questioned practice not necessarily routine, but not totally unexpected (score 2)
___Questioned practice unexpected (score 3)
___Questioned practice very unexpected (score 4)

III. Provide summary comments: _____

_____

_____

_____

IV. Based on the above, the following action is recommended:

___No action necessary
___Case to be logged for trending
___Practitioner requested to respond to an inquiry from this Committee
___Practitioner to appear before the next meeting of this Committee
___Practitioner to be counseled by the Chief of Service or designee
___Practitioner to complete or correct the medical record
___Recommendation to be made to the Surgical Advisory Committee for:

___Further proctoring
___Consultation for the performance of specified procedures
___A change in privilege delineation

___Case to be referred to_____ for further review.

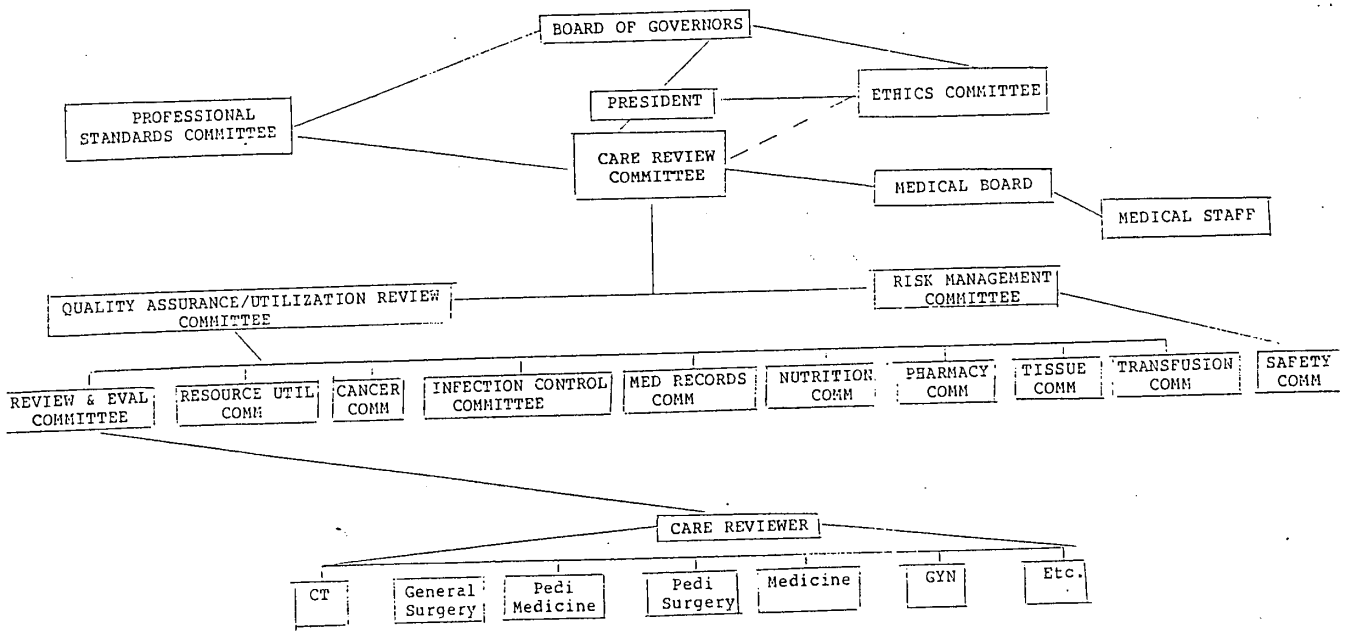
_____

Signature of Reviewing Practitioner

New England Medical Center

CARE REVIEW PROGRAM
ORGANIZATIONAL CHART

January, 1990



Appendix D

This appendix contains a report from the Maryland Hospital Association Quality Indicators (QI) project. It illustrates how interhospital comparisons are used to evaluate hospital and clinician performance.

the maryland hospital association ◇ 1301 york road, suite 800, lutherville, maryland 21093-6087 □ telephone 301/321-6200

REPORT OF THE MARYLAND HOSPITAL ASSOCIATION QUALITY INDICATOR PROJECT

APRIL THROUGH JUNE 1990

Quality Indicator Project

REPORT OF THE MARYLAND HOSPITAL ASSOCIATION
QUALITY INDICATOR PROJECT
APRIL THROUGH JUNE 1990

EXECUTIVE SUMMARY

This report presents the results of second quarter 1990 data analysis from a total of 242 hospitals throughout the country from multi-hospital systems and state hospital associations participating in the Maryland Hospital Association's (MHA) Quality Indicator (QI) Project.

The number of hospitals submitting data through the Automated Data Collection (ADC) Software System continues to increase; this quarter 217 hospitals submitted data using the software.

This report presents the analysis of the ten indicators compared to the average rate of the sample and comparison of similar-sized hospitals' rates for each indicator. The database profile for the ten indicators for the April through June 1990 quarter indicates that:

- The mean rate of Indicator I--Hospital Acquired Infections--as well as the variation between hospitals, have decreased. The rate of this indicator has shown on the average, moderate variation over the past nine quarters.

- The mean rate of Indicator II--Surgical Wound Infections--has been fairly constant over time, although the variation between hospitals continues to be noteworthy.

- Both the mean rate and the inter-hospital variability for Indicator III--Inpatient Mortality--decreased this quarter. But, the overall profile over the past ten quarters is that of "high-low" cyclical variation. The variation in the indicator rates is probably affected by outlier statistics. The magnitude of the mean rate would be minimally affected.

- The rate for Indicator IV--Neonatal Mortality--stayed low and affected by the low occurrence frequency. This indicator will always be a sentinel indicator, the rate of which will be largely affected by small changes.

- The trend in the rates of Indicator V--Perioperative Mortality--are similar to Indicator IV--Neonatal Mortality's small sample sizes and sentinel effects.

- more -

- Indicator VI--Cesarean Sections--demonstrates an intriguing difference between small and large hospitals. Smaller hospitals have demonstrated a greater rate and higher variation than their larger peers.

- The stability of Indicator VII--Unplanned Readmissions--continues, suggesting that the mean rate is a reliable reference point for comparisons.

- The rate of Indicator VIII--Unplanned Admissions Following Ambulatory Surgery--is still variable, although there are signs of rate stabilization.

- The large fluctuations in the rate of Indicator IX--Unplanned Returns to a Special Care Unit--should be interpreted with caution. A reliable reference point has not yet been determined.

- The most stable indicator rate is that of Indicator X--Unplanned Returns to the Operating Room. It has been virtually constant for all participants throughout the Project.

As has been emphasized throughout the QI Project, any interpretation of these data should be considered preliminary and conclusions cautiously drawn from this research project.

ANALYSIS OF SECOND QUARTER 1990 DATA

INTRODUCTION

The analysis of the second quarter 1990 indicator rates is based on the data submitted by 242 hospitals. This report contains data that have been collected for eleven consecutive calendar quarters from Maryland hospitals, and for up to eight quarters from participating non-Maryland hospitals.

The frequency of data collection and reporting using the ADC Software System continues to increase: 209 hospitals used the software last quarter; 217 hospitals submitted their data on diskette this quarter. The increased computerization of the data collection method not only assures the reporting of more accurate data, but also provides individual hospitals with the ability to store these data and generate their own analyses.

PRESENTATION OF DATA

The data are presented in five tables:

- Table I shows each hospital's rates compared to other hospitals in the Project;
- Table II shows the distribution of each indicator's rates by hospital size;
- Table III presents the amount of variation among hospitals since the beginning of the Project;
- Table IV is a graphic presentation of the information in Table I--each hospital's rates are shown relative to the sample mean; and,
- Table V is the breakdown of five indicators' rates by patient or disease severity groupings.

MODIFICATIONS IN QI PROJECT QUARTERLY ANALYSIS REPORTING

There is a modification in the April through June 1990 quarterly report. Consequent to discussions with QI Project participants, the rate for Indicator IV--Neonatal Mortality has been modified. Instead of providing the mortality rate for neonates under 750 grams, Tables I, II, III, and IV now show the mortality rate for neonates 1800 grams and above. In addition, the trend in the database standard deviation (SD)--Table III--will be the trend of the new birth weight category. Thus, the trend analysis of the (SD) for Indicator IV will show values different than those in previous reports. In short, data

for Indicator IV have been recalculated retrospectively, going back to the earliest participation quarter. These new values (rates and standard deviation) are expected to provide parallel information about trends in neonatal deaths less than 750 grams and more than 1800 grams.

The reason for the change was based on the continuing small sample size for Indicator IV. In previous quarters, the cautions involved with the interpretation of small samples served as a useful educational tool for hospitals. After more than two years of analysis, it was decided to change the rate to a birth weight category in which any death will serve as a flag to more hospitals. It is important to remember that this indicator, no matter what way analyzed, will probably always be a sentinel effect indicator. It is the interpretation of the rate in different categories that will assist hospitals. It is also important to note that the rate as calculated now will be a smaller number than previously; the reason is the much larger denominator (neonates weighing 1800 grams or more). The modification of the rate will not affect Table V, where rates for all birth weight categories continue to be displayed.

THE DATA

The quality of the data being submitted by hospitals continues to improve; fewer inaccuracies in previous quarters' data have been identified. Data changes are continuously incorporated into the central database and new rates calculated. Slight changes in previous rates when compared to this report are due to this enhancement.

This is the third report in which both Maryland and non-Maryland hospitals' data are analyzed as one database. The similarities in the rates and their distributional profiles both continue to support and justify the merging of the databases. The outcome of this analysis is the identification of reference points to which each hospital's rates are compared.

QUARTERLY TREND COMPARISONS

In past quarters, trends in each indicator's rate were shown through two sets of bar charts: one for all Maryland hospitals and another for all non-Maryland hospitals participating in the Project. Since the merging of the two databases in the October through December 1989 quarter, a new pattern of analysis has emerged. Three quarters' data are analyzed in the present report; the trends seem to indicate that there are no unexpected or sudden effects attributable to the merger of Maryland and

non-Maryland data. Indeed, not only have the rates stayed remarkably stable over the past three quarters, they also bear a striking comparability to Maryland hospitals' rates.

RESULTS

Indicator I: Hospital Acquired Infections

The mean rate of hospital acquired infections in all hospitals this quarter is 3.39 percent per 1,000 patient days. As for the inter-hospital variation in the rate of this indicator, there is a noteworthy decrease (shown in Table III). The (SD) for this quarter is 2.27, compared to 2.70 last quarter. This 19 percent decrease is important to note and requires clarification. Although it is too early to draw definitive conclusions, the variation in this indicator has shown its highest value of 24.8 percent and lowest value of 1.1 percent. Excluding these extreme values, however, the variation has been moderate at best (less than 24 percent). Even the merging of the Maryland and non-Maryland hospitals' data did not substantially impact the variation.

Indicator II: Surgical Wound Infections

The mean rate of this indicator in all hospitals is about 1 percent (see Table I), and the inter-hospital variation is 1.24 (see Table III). It is important to note that in the past four reports the rate of this indicator has been limited to Class 1 and Class 2 wounds. There is an increase in both the rate (minus 4 percent) and the inter-hospital variation (a increase in the (SD) of 29 percent). There are two observations to be made:

- The variation pattern in the rate among Maryland hospitals and other hospitals is small. Although a "see-saw" profile is apparent, the magnitude of that variation is probably insignificant. For all practical purposes, the rate in this indicator has been about 1 percent since the beginning of the Project.

- The (SD) shows a slight increase since the merging of the Maryland and non-Maryland databases. This may be due to more variability among the non-Maryland hospitals than Maryland hospitals in the incidence (or reporting) of Class 1 and Class 2 surgical wound infections.

The variation in this indicator's rates will be monitored throughout the year to explore its reasons.

Indicator III: Inpatient Mortality

The average inpatient mortality rate of all hospitals is 2.50 percent-- almost 14 percent lower than last quarter. The inter-hospital variation has decreased 16.8 percent (see Table III). As in Indicator II, there is a perfect "high-low see-saw" pattern in the variation of the (SD) across the past ten quarters among all participants. Such persistent trends indicate that the observed variation is most likely not due to differences in data collection. In addition, should the decrease in or stabilization of the mean rate continue and the (SD) remain high, it might indicate that, although most hospitals' rates are quite comparable and similar, there are outliers that vary substantially from the rest. The identification of these outliers is essential for assessing the sensitivity of this indicator. Other reasons for the variation are also being explored.

Indicator IV--Neonatal Mortality

As discussed at the outset, the rate of this indicator has been changed in response to user request. In past reports, the neonatal mortality rate was calculated for neonates in the 750 or less grams birth weight category. As expected from a sentinel indicator, few neonatal mortalities were reported. When translated into rates, sometimes one neonatal death increased the rate by as much as 100 percent. Such misleading observations are characteristic of small samples and the value of this indicator was seen mostly as an educational tool for the cautious interpretation of rates from small samples.

The change in the rate of this indicator is introduced in this report and pertains to Tables I, II, III, and IV. The present rate is for neonates **weighing 1800 grams or more**. Clearly, no matter how the rates are calculated, Indicator IV will remain a sentinel indicator. However, the new rate has advantages over the previous formula. First, the number of neonates in the 1800 grams or more category is larger than the number of neonates in the 750 grams or less category. Translated into rates, the new rate takes away the artifactually inflated values of 40, 50, or even 100 percent neonatal mortality per hospital. Second, most hospitals have no or very few neonates in the 750 or less grams category. The rarity of the cases made inter-hospital comparisons even more precarious. Third, even as a sentinel indicator, the death of neonates at lower risk for death triggers a totally different set of questions that the analysis of high risk neonates may not have.

Unchanged are each hospital's adjusted rates (shown in Table V), providing a complete picture for the neonatal mortality rate in all birth weight categories.

The mean neonatal mortality rate for the 1800 grams or more birth weight category from the 183 reporting hospitals was 0.15 percent for this quarter and the standard deviation 0.79.

Indicator V: Perioperative Mortality

The number of perioperative deaths is presently, and is expected to continue to be, small across all hospitals. Due to the small number of cases, it is imperative to analyze the death rates within each ASA classification group. As in the case of neonatal mortality rates, Table V provides a more reliable interpretation through the adjustment by risk categories--the ASA classes and sample sizes.

Indicator VI: Cesarean Sections

The cesarean section mean rate is 23.83 percent this quarter and the inter-hospital variation for this indicator has substantially increased. The 23.83 percent rate is comparable to the Maryland hospitals' rate, indicating that, generally, there was no substantial difference in the average rate of cesarean section between the 194 reporting hospitals this quarter. The variability among the hospitals is, however, still very high and increasing. One observation that has been made repeatedly is that the difference in the rates is more variable across smaller hospitals compared to larger hospitals (see Table II). For example, the (SD) was 12.65 for hospitals with 149 beds or less compared to (SD)s of 5.33 and 6.12 for the other two bed size groupings. It is noteworthy that the rate of cesarean section has also been **higher** in smaller hospitals expected to handle less complicated deliveries. Another factor is the variability in the distribution of the rates over time across hospitals. There is a "tightening" of the rates around the average rate, but there are "outliers" that are still noticeably variable and affecting the distributional characteristics of the database.

Indicator VII: Unplanned Readmissions

The rate of this indicator continues to show very little change over the past eleven quarters, and its stability is unaffected by the merging of the Maryland and non-Maryland databases. The inter-hospital variation in this indicator is also stable--3.08 for all hospitals; last quarter it was 2.16. The lack of variation in this indicator's rates over the past ten quarters has been under review since June 1989. The anticipated variability in the definition of "unplanned" does not seem to affect the aggregate rate of this indicator. Perhaps the definitional difference is more perceived and not large enough to affect the analysis. The sample standard deviation (Table III) remains within the same magnitude of 2.04.

Indicator VIII: Unplanned Admissions Following Ambulatory Surgery

For the first time in the past ten quarters, there is a decrease in this indicator's mean rate and its variation across the 228 reporting hospitals. The aggregate sample shows a 14.4 percent decrease in the mean rate. This is also reflected in the inter-hospital variation, which has decreased by 13 percent. In previous reports, the lack of stabilization was pointed out. It is possible that the expected stabilization and "plateauing" of the mean rate is being observed in this report.

Indicator IX: Unplanned Returns to a Special Care Unit

The mean rate for this indicator has shown an interesting profile over the past nine quarters. While the rate range was 2.1-2.7 percent for the first four quarters, the rate for the fourth quarter of 1988 jumped to a high of 3.6 percent, while the first quarter of 1989 showed a substantial decrease of 11 percent. The decrease continued in the second quarter of 1989. In the fourth quarter of 1989, the rate was back to the higher percent range (4.5), whereas the first quarter of 1990 showed a rate of 3.96 percent. The rate for second quarter 1990 is 3.36 percent, accompanied by a sample standard deviation of 5.39. The fluctuation in these rates may indicate the lack of a reliable reference point. The inter-hospital variability shows a similar pattern of inconsistency. The analysis based on the total sample of hospitals is expected to yield a rate profile that will facilitate comparison between the pre- and post-merged databases. The substantial variability (see Table III) still makes any comparisons unwarranted at this time.

Indicator X: Unplanned Returns to the Operating Room

Over the past ten quarters, the mean rate of unplanned returns to the operating room has stabilized around 1 percent. The rate for all hospitals is 1.02 percent for the second quarter of 1990. The stabilization pattern seems increasingly clear, since the trend in the inter-hospital variation is relatively within the same order of magnitude. The mean rate and inter-hospital variation trends do not seem to indicate apparent differences in the definition of "unplanned" returns, as is possibly the case with the preceding indicator.

nth
9/8/90

MHA QUALITY INDICATOR PROJECT -- TABLE I
HOSPITAL-SPECIFIC REPORT

INDICATORS	HOSPITAL # 1006					OTHER HOSPITALS		
	Sep 89	Dec 89	Mar 90	Jun 90	Hospital Mean YTD	# of Hosp	Mean	SCI
RATE I	INC	INC	INC	INC	NA	189	3.39	0.00 - 7.93
RATE II	1.92	2.09	1.80	1.76	1.89	190	1.04	0.00 - 3.51
RATE III	INC	INC	INC	INC	NA	211	2.50	0.00 - 5.59
RATE IV	0.09	0.00	0.09	0.00	0.05	183	0.15	0.00 - 1.73
RATE V	0.17	0.28	0.17	0.32	0.24	205	0.18	0.00 - 0.80
RATE VI	12.69	16.76	20.20	18.74	17.10	194	23.83	5.41 - 42.24
RATE VII	INC	INC	INC	INC	NA	191	3.08	0.00 - 7.16
RATE VIII	0.25	0.00	1.22	INC	0.49	228	1.94	0.00 - 5.79
RATE IX	INC	INC	INC	INC	NA	204	3.36	0.00 - 14.13
RATE X	INC	INC	INC	INC	NA	225	1.02	0.00 - 3.64

Rate	I	Hospital Acquired Infections
Rate	II	Surgical Wound Infections (Class 1 & 2 Only)
Rate	III	Inpatient Mortality
Rate	IV	Neonatal Mortality (>1800 gms)
Rate	V	Perioperative Mortality
Rate	VI	Cesarean Sections
Rate	VII	Unplanned Readmissions
Rate	VIII	Unplanned Admissions Following Ambulatory Surgery
Rate	IX	Unplanned Returns To Special Care Unit
Rate	X	Unplanned Returns To Operating Room

MHA QUALITY INDICATOR PROJECT AGGREGATE DATA REPORT -- TABLE II

COMPARISON OF INDICATORS BY HOSPITAL SIZE

TIME FRAME (Qr/Yr): 2/90

Hospitals Grouped By Bed Size	INDICATORS									
	I MEAN (SD)	II MEAN (SD)	III MEAN (SD)	IV MEAN (SD)	V MEAN (SD)	VI MEAN (SD)	VII MEAN (SD)	VIII MEAN (SD)	IX MEAN (SD)	X MEAN (SD)
149 or Less Beds	3.46 (2.18) n= 83	0.96 (1.36) n= 85	1.97 (1.53) n= 88	0.09 (0.58) n= 70	0.13 (0.40) n= 78	25.08 (12.65) n= 74	3.16 (2.00) n= 82	1.74 (2.07) n= 86	2.58 (2.78) n= 74	0.86 (1.53) n= 87
Between 150 - 299 Beds	3.50 (2.31) n= 59	1.05 (1.38) n= 57	2.88 (1.46) n= 63	0.08 (0.28) n= 45	0.15 (0.20) n= 62	22.25 (5.33) n= 45	3.39 (2.04) n= 60	2.29 (1.77) n= 67	3.54 (7.43) n= 65	1.11 (0.86) n= 65
300 or More Beds	3.10 (2.46) n= 44	1.20 (0.75) n= 47	2.95 (1.41) n= 57	0.28 (1.14) n= 66	0.28 (0.27) n= 63	23.10 (6.12) n= 73	2.62 (2.06) n= 47	1.90 (1.88) n= 73	4.15 (5.23) n= 63	1.16 (1.36) n= 71

'n' represents the number of hospitals with complete data

- I Hospital Acquired Infections
- II Surgical Wound Infections
- III Inpatient Mortality
- IV Neonatal Mortality
- V Perioperative Mortality
- VI Cesarean Sections
- VII Unplanned Readmissions
- VIII Unplanned Admissions Following Ambulatory Surgery
- IX Unplanned Returns To Special Care Unit
- X Unplanned Returns To Operating Room

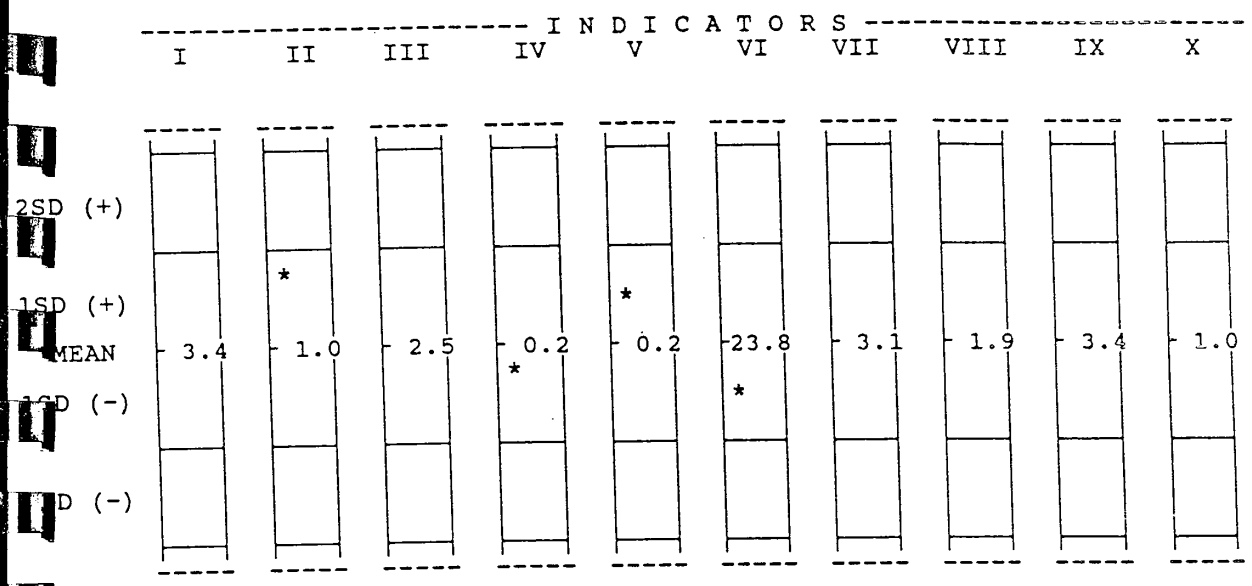
MHA QUALITY INDICATOR PROJECT -- TABLE III

VARIATION OF THE SAMPLE STANDARD DEVIATION OVER TIME

INDICATOR	88/1	88/2	88/3	88/4	89/1	89/2	89/3	89/4	90/1	90/2
Hospital Acquired Infections	2.12	2.65	2.47	2.38	2.62	2.48	2.32	2.82	2.70	2.27
Surgical Wound Infections	0.78	0.76	0.78	1.32	0.87	0.89	1.00	0.96	0.88	1.24
Inpatient Mortality	1.29	1.27	1.09	1.14	1.73	1.58	1.49	1.58	1.80	1.54
Neonatal Mortality	0.21	0.42	0.63	0.22	0.19	0.26	0.72	0.21	0.21	0.79
Peri-Operative Mortality	0.12	0.19	0.28	0.29	0.25	0.26	0.22	0.25	0.25	0.31
Cesarean Sections	6.55	7.40	6.41	7.14	6.96	6.78	9.40	9.17	6.72	9.21
Unplanned Re-admissions	1.52	1.76	2.12	2.03	2.13	2.20	2.05	1.97	7.39	2.04
Unpl. Adm. Ambulatory Surgery	2.11	1.84	2.75	2.19	2.25	3.08	2.45	2.12	2.17	1.92
Unpl. Ret. Special Care Unit	3.60	2.35	4.23	5.86	2.65	4.28	3.89	9.42	8.18	5.39
Unpl. Ret. Operating Room	1.08	0.95	1.17	1.13	1.16	1.08	1.20	1.08	1.72	1.31

MHA QUALITY INDICATOR PROJECT - TABLE IV

Position of Hospital Mean and Relation to Sample Mean Within the SCI
Hospital #1006 - 2/90

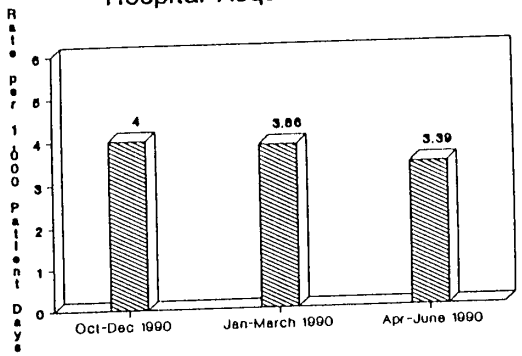


I	Hospital Acquired Infections
II	Surgical Wound Infections (Class 1 & 2 Only)
III	Inpatient Mortality
IV	Neonatal Mortality (>1800 gms)
V	Perioperative Mortality
VI	Cesarean Sections
VII	Unplanned Readmissions
VIII	Unplanned Admissions Following Ambulatory Surgery
IX	Unplanned Returns To Special Care Unit
X	Unplanned Returns To Operating Room

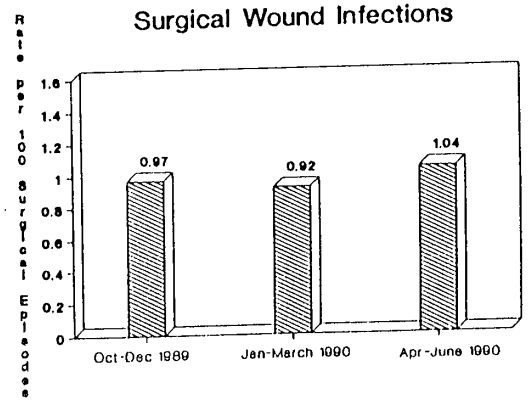
Note: No asterisk means that either the sample SD or the rate for that indicator is not available.

QUALITY INDICATOR PROJECT
Comparison Rates
All Participating Hospitals

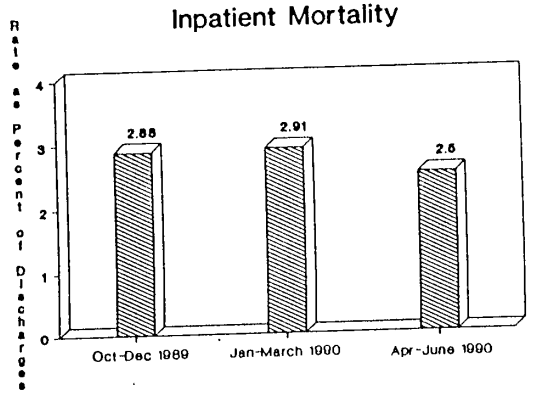
Indicator I
Hospital Acquired Infections



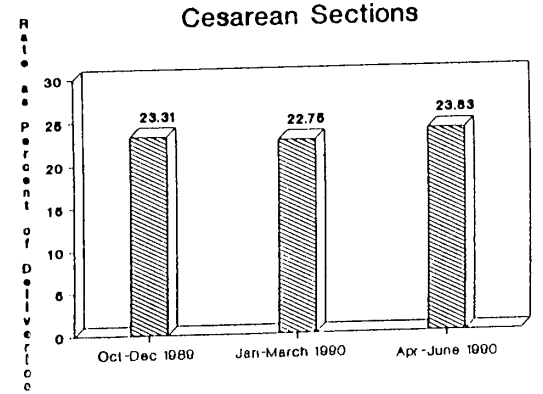
Indicator II
Surgical Wound Infections



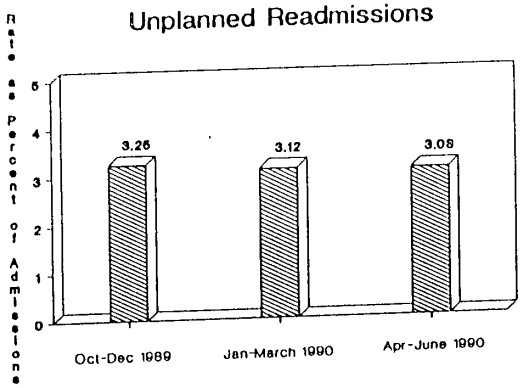
Indicator III
Inpatient Mortality



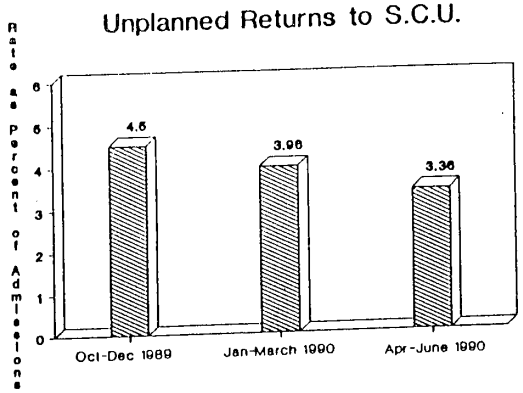
Indicator VI
Cesarean Sections



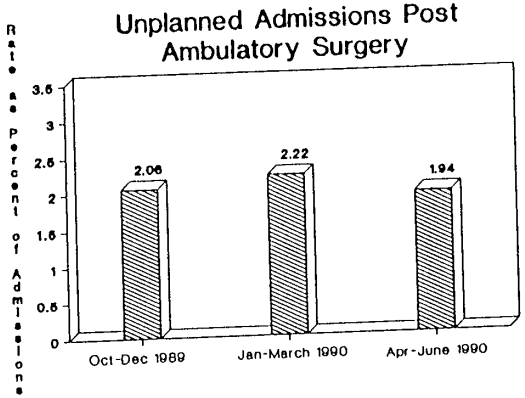
Indicator VII
Unplanned Readmissions



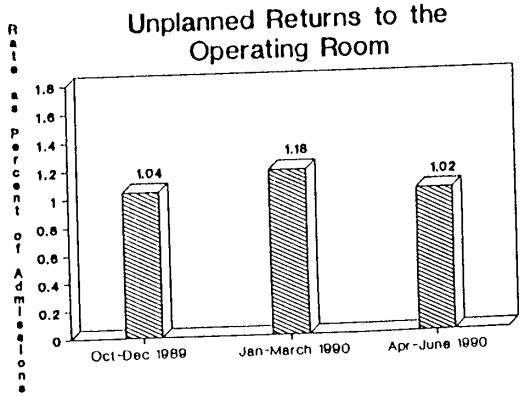
Indicator IX
Unplanned Returns to S.C.U.



Indicator VIII
Unplanned Admissions Post Ambulatory Surgery



Indicator X
Unplanned Returns to the Operating Room



MHA QUALITY INDICATOR PROJECT - TABLE V

BREAKDOWN OF HOSPITAL RATES COMPARED TO A CORRESPONDING SAMPLE

Hospital #1006 Quarter: 2/90

INDICATOR	RATE Hospital	RATE Sample	BREAKDOWN Hospital	BREAKDOWN Sample	BREAKDOWN Hospital	BREAKDOWN Sample
II	1.76 (**2267**)	1.04 (**167611**) Class 1 & 2 Only Included in Rate	Class 1 1.45 (**1310**)	0.89 (**90550**)	Class 2 2.19 (**957**)	1.05 (**67466**)
			Class 3 1.08 (**93**)	2.30 (**6566**)	Class 4 3.57 (**28**)	3.86 (**3029**)
III	***** (**0**)	2.50 (**509389**)	Expected ***** (**0**)	1.55 (**509389**)	Unexpected ***** (**0**)	0.31 (**509389**)
IV	0.00 (**0**)	0.15 (**67105**)	NBN<1000 ***** (**0**)	5.94 (**572**)	NBN 1001-1800 0.00 (**5**)	1.34 (**1423**)
			NBN >1800 0.00 (**1132**)	0.04 (**60294**)	NICU<1000 ***** (**0**)	15.34 (**339**)
			NICU 1001-1800 ***** (**0**)	3.22 (**621**)	NICU> 1800 ***** (**0**)	1.69 (**3856**)
V	0.32 (**2465**)	0.18 (**182161**)	ASA #1NE ***** (**0**)	0.00 (**60112**)	ASA #1E ***** (**0**)	0.03 (**6460**)
			ASA #2NE ***** (**0**)	0.01 (**63684**)	ASA #2E ***** (**0**)	0.07 (**8512**)
			ASA #3NE ***** (**0**)	0.14 (**30414**)	ASA #3E ***** (**0**)	0.44 (**3870**)
			ASA #4NE ***** (**0**)	0.94 (**6577**)	ASA #4E ***** (**0**)	4.03 (**2058**)
			ASA #5NE ***** (**0**)	2.88 (**139**)	ASA #5E ***** (**0**)	29.55 (**335**)
VI	18.74 (**1131**)	23.83 (**71296**)	Primary Deliveries 11.55 (**1039**)	15.86 (**65394**)	Repeat Deliveries 9.10 (**1011**)	9.69 (**60923**)

II Surgical Wound Infections (Class 1 & 2 Only)
III Inpatient Mortality
IV Neonatal Mortality
V Perioperative Mortality
VI Cesarean Section

NOTE: Indicator II rates are based on cases in Classes 1 & 2 only

Numbers in parentheses and bolded represent the denominator of the rate
Asterisks indicate no data reported for that indicator

Appendix E

This appendix contains an example report from the Professional Activity Study (PAS) database maintained by the Commission on Professional Hospital Activity (CPHA).

PAS...

a New Dimension of Service

CPHA Commission on Professional and Hospital Activities *1968 Green Road, Ann Arbor, Michigan 48105*

592

CPHA PAS Professional Activity Study

Executive Summary

9798
JAN 1979

SAMPLE HOSPITAL
ANYTOWN, USA

1. CLASSIFICATION OF PATIENTS

A

	PATIENTS	TOTAL DAYS	AVG STAY
GRAND TOTAL	918	7738	8.4
TOTAL EXCEPT NEWBORN	777	7091	9.1
TOTAL EXCEPT NEWBORN, OB	592	6304	10.6

B TOTAL ABSTRACTS (INCLUDES STILLBORN): 918

C. STILLBORN

TOTAL AUTOPSIED

D RACE

	TOTAL	%
WHITE, NON-HISP.	905	99
BLACK, NON-HISP.	9	1
ASIAN/PACIFIC IS.	2	+
HISPANIC		
OTHER		
NO VALID ENTRY	2	+

E. SEX

	TOTAL	%
MALE	340	37
FEMALE	578	63
NO VALID ENTRY		

F. ADMISSION

	TOTAL	%
EMERGENCY	326	42
URGENT	77	10
THRU ER	264	34
FROM OTH. ACUTE FAC.		
FROM SNF		
READMIT	421	54

G. DISPOSITION

	TOTAL	%
ALIVE	886	97
HOME/SELF CARE	848	96
AGAINST ADVICE	5	1
SHORT TERM HOSP.		
SNF	15	2
ICF	3	+
OTHER FACILITY	2	+
HOME HEALTH SVC.	13	2
EXPIRED	32	3
AUTOPSIED	9	28
CORONER'S CASE	1	3
EMERGENCY ADM.	29	91
EMER. DEPT. ADM.	28	88
WITHIN 2 DAYS	6	19

	TOTAL	RATE
OPERATED IN OR POST OP	9	2
NEONATAL		
NO VALID ENTRY	TOTAL	%

H.

DEATH IN 48	6

2. EXPECTED SOURCE OF PAYMENT

PAYMENT TYPE	TOTAL PRINCIPAL	% PRINCIPAL	TOTAL SECONDARY
MEDICARE	153	17	
MEDICAID	30	3	3
TITLE V (M & CH)			
OTHER GOVT. PAY.	10	1	1
WORKMEN'S COMP.	7	1	
BLUE CROSS	517	56	120
INSURANCE CO.	129	14	7
SELF PAY	8	1	
NO CHARGE	55	6	
OTHER	8	1	
NO VALID ENTRY	1	+	

3. HOSPITAL PERFORMANCE INDICATORS

A. PERFORMANCE INDICES†

	THIS REPORT PERIOD	LAST REPORT PERIOD	THIS PERIOD 1 YEAR AGO
RESOURCE NEED INDEX			
LENGTH OF STAY INDEX			
FATALITY INDEX			
PERINATAL MORTALITY INDEX			
NEONATAL MORTALITY INDEX			

B. OPERATED PATIENTS

	PATIENTS
OPERATED	407
OPERATED WITHIN 6 HRS.	58
MORE THAN 1 EPISODE	156

D. SPECIAL CARE UNITS

	PATIENTS	TOTAL DAYS
INTENSIVE	15	115
CARDIAC	12	41
SPECIAL	1	5

C. PATIENTS WITH CONSULTATIONS

NUMBER	340
PERCENT	37

E. PATIENTS WITHOUT MINIMUM WORKUP†

NUMBER	102
PERCENT	11

4. DATA QUALITY INDICATORS

DATE CPHA RECEIVED LAST ABSTRACT FOR THIS PERIOD FEB 14, 1979
TOTAL ABSTRACTS WITH ERRORS 30
TOTAL ERRORS 110

5. LENGTH OF STAY DATA

A. STAYS UNDER 3 DAYS (EXCLUDES DEATHS)

NO. OF NOT OVER-NIGHT STAYS	NO. OF 1 OR 2 DAY STAYS
7	122

STAYS OVER 30 DAYS (INCLUDES DEATHS) TOTAL NUMBER: 36

B. DATA BY DAY OF THE WEEK (EXCLUDES NEWBORN, OB)

	ALL PTS.	MON	TUE	WED	THU	FRI	SAT	SUN
GEOMETRIC MEAN STAY BY DAY OF ADMISSION	6.7	6.0	5.8	6.9	5.8	8.0	9.8	6.3
IS STAY SIGNIFICANTLY DIFF. FROM?							YES	
% ADMITTED ON		12	12	14	17	12	13	20
% DISCHARGED ON		7	16	14	15	16	19	14
% OPERATED ON DAY OF OR DAY AFTER ADMISSION		80	89	77	78	39	36	78

Activity Report

SAMPLE HOSPITAL - ANYTOWN, USA — Summary by HOSPITAL SERVICE — JAN 79

CLASSIFICATION OF PATIENTS — HOSPITAL SERVICE		ALL PATIENTS			% MALES	PATIENTS BY AGE								VARIABLE DATA		DEATHS				Total Patients Operated	% Patients with Consultations
						16 yrs & younger		17-39 yrs		40-64 yrs		65 + yrs		% thru ER		Total	RATE	AUTOPSIED			
		Total Patients	Total Days	Avg Stay		Patients	Total Days	Patients	Total Days	Patients	Total Days	Patients	Total Days					No.	Rate		
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
02 PEDIATRICS	S	5	28	5.6	60	5	28							80						1	11
02 PEDIATRICS	P	36	179	5.0	50	36	179							44						5	63
10 MEDICINE	S	30	484	16.1	60			3	25	17	254	10	205	93		5	17	2	40	5	63
10 MEDICINE	P	153	2480	16.2	46			16	161	50	847	87	1472	80		22	14	6	28	34	44
20 ALLERGY	P	1	1	1.0				1	1					100							
32 NEUROLOGY	P	6	61	10.2	33			3	35	3	26			33						4	67
38 PSYCHIATRY	P	24	444	18.5	33	1	13	14	237	9	194			13						3	63
TOTAL STAFF		35	512	14.6	60	5	28	3	25	17	254	10	205	91		5	14	2	40	5	54
TOTAL PRIVATE		220	3165	14.3	45	37	192	34	434	62	1067	87	1472	65		22	10	6	28	42	41
TOTAL 02-38		255	3677	14.4	47	42	220	37	459	79	1321	97	1677	69		27	11	8	30	47	43
40 SURGERY	S	2	10	5.0				2	10											2	
40 SURGERY	P	117	1147	9.8	46	12	32	59	310	23	449	23	356	48		2	2			88	41
46 THORACIC	P	2	18	9.0	50					2	18									2	50
48 OPHTHALMOL	P	12	60	5.0	33			1	2	3	15	8	43							12	
50 ENT	P	37	60	1.6	54	26	28	7	15	3	8	1	9							37	3
54 DENTAL	P	1	3	3.0	**			1	3					100						1	100
58 ORTHOPEDICS	P	61	430	8.7	56	11	71	20	125	22	78	8	107	48		1	2			45	15
62 UROLOGY	P	40	448	11.2	63	4	20	8	69	16	91	12	169	32		1	3			38	40
64 NEUROLOGY	P	10	131	13.1	60	2	3	2	11			1	18	80		1	10	1	**	6	50
TOTAL STAFF		2	10	5.0				2	10											2	
TOTAL PRIVATE		280	2297	8.2	52	55	154	98	674	74	906	53	702	38		5	2	1	20	229	28
TOTAL 40-64		282	2307	8.2	52	55	154	100	684	74	906	53	702	38		5	2	1	20	231	28
																				1	
										2	10									53	13
70 GYNECOLOGY	S	2	10	5.0				30	123	22	159	1	28	9						2	50
70 GYNECOLOGY	P	53	310	5.8				2	11					73						14	
75 ABORTION	S	2	11	5.5				15	32												
75 ABORTION	P	15	2	0.1				2	4					29						5	21
76 OB NOT DEL	S	2	20	10.0				14	55											9	4
76 OB NOT DEL	P	14	55	3.9				21	77					2						45	11
77 OB DEL	S	24	87	3.6		3	10	126	587	1	5									12	7
77 OB DEL	P	128	598	4.7		1	6	25	92	2	10									117	11
TOTAL STAFF		30	112	3.7		3	10	185	797	23	164	1	28	11						129	11
TOTAL PRIVATE		210	995	4.7		1	6	210	889	25	174	1	28	10							
TOTAL 70-77		240	1107	4.6		4	16													94	
																				89	
80 NEWBORN	S	16	99	6.2	63	16	99													89	
80 NEWBORN	P	125	548	4.4	51	125	548														
TOTAL 80		141	647	4.6	52	141	647														
GRAND TOTAL STAFF		83	733	8.8	35	24	137	30	127	19	264	10	205	39		5	14	2	40	19	39
GRAND TOTAL PRIVATE		835	7005	8.4	43	218	900	317	1766	159	2137	141	2202	33		27	3	7	26	388	43
GRAND TOTAL		918	7738	8.4	37	242	1037	347	1893	178	2401	151	2407	34		32	3	9	28	407	37

*Figure exceeds space provided.

For percents, I suggest between 0 and 0.5%

PAS Professional Activity Study — Activity Report — Page 1 — 1

SAMPLE HOSPITAL - ANYTOWN, USA — Summary by PRINCIPAL SOURCE OF PAYMENT — N 1979

CLASSIFICATION OF PATIENTS PRINCIPAL SOURCE OF PAYMENT	ALL PATIENTS			% MALES	PATIENTS BY AGE								VARIABLE DATA		DEATHS				Total Patients Operated	% Patients with Consultations
					16 yrs & younger		17-39 yrs		40-64 yrs		65 + yrs						AUTOPSIED			
	Total Patients	Total Days	Avg Stay		Patients	Total Days	Patients	Total Days	Patients	Total Days	Patients	Total Days			Total	RATE	No	Rate		
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MEDICARE	153	2425	15.8	52	1	7	1	8	6	66	145	2344			20	13	4	25	66	51
MEDICAID	30	243	8.1	17	9	34	17	158	4	51									8	27
TITLE V (M & CH)																				
OTHER GOV'T PAYMENT	10	68	6.8	20	4	19	2	8	4	41									2	40
WORKER'S COMP	7	56	8.0	**			4	26	3	30									5	29
BLUE CROSS	517	3629	7.0	33	156	670	245	1326	111	1571	5	62			8	2	3	38	251	30
INSURANCE COMPANY	129	858	6.7	29	44	180	52	261	32	416	1	1			2	2	1	50	63	33
SELF PAY	8	29	3.6	38	6	21	2	8											1	50
OTHER	8	52	6.5	50	3	22	3	15	2	15					1	13			1	50
NO CHARGE	55	373	6.8	36	18	79	21	83	16	2					1	2	1	**	10	38
INVALID/UNRECORDED	1	5	5.0		1	5														**
TOTAL	918	7738	8.4	37	242	1037	347	1	178	2401	151	2407			32	3	9	28	407	37

*Figure exceeds space provided.
For percents, - means between 0 and 0.5%

9798
JAN-JUN 1979

SAMPLE HOSPITAL - ANYTOWN, USA

CLASSIFICATION OF PATIENTS	TOTALS		PATIENTS BY AGE AND % MALE								PATIENTS BY RACE			PATIENTS BY EXPECTED SOURCE OF PRINCIPAL PAYMENT							
SERVICE, LOCALITY CODE	PATIENTS	DAYS	NB-16 yrs	%	17-39 yrs	%	40-64 yrs	%	65+ yrs	%	BLACK	WHITE	OTHER	Medicare	Medicaid	Title V (M & CH)	Other Govt	Workers Comp	Blue Cross	Insurance Company	Self-Payment	Other
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
02 PEDIATRIC MEDICINE																						
98101	5	22	5	20								5							4	1		
98120	1	7	1	**								1							1			1
98122	1	4	1	**								1										
98125	5	22	5	40								5							4	1		
98135	3	5	3	33								3							3			
98152	2	5	2	50								2					1		1			
98164	1	4	1									1										1
98174	2	14	2	**								2								1		1
98180	10	54	10	63								10			1				6		2	1
98183	4	24	4	50								4							1	3		
98184	1	7	1	**								1								1		
98185	2	6	2	**								2							1	1		
98209	1	7	1	**								1								1		
98216	1	4	1									1										
98218	2	10	2	**								2							2			
98228	2	15	2									2							1			1
NO VALID ENTRY																						
TOTAL	43	210	43								4	34	5	1	1	1	1		24	10	2	5
10 MEDICINE																						
97660	1	21				**						1		1								
98073	1	8			1							1							1			
98078	1	8			1							1							1			
98101	11	119						50	5	20		11		5			1		5			1
98109	1	21							1			1		1								
98111	3	48					3	33			1	2										2
98120	9	94					5	80	4	50		9		5					4			3
98122	6	107					3		3	33		6		3			1		1	1		
98123	1	15					1	**				1										1
98124	29	497			1		14	36	14	43		29		14					13			1
98125	10	114			2	**	3	67	5	40		10		5					3		1	1
98126	34	521			1		6	83	27	48		34		27					3			1
98127	7	80			1	**	4	25	2	50		7		3					2	1		1
98128	7	122				**	2	50	5	80		7		5					2			
98135	5	113			1	**	1	**	3			5		3					2			
98146	7	77			1	**	5	40	1			7		1			1		4	1		
98150	1	34							1	**		1		1								
98154	2	38					1		1	**		2		1					1			
98167	1	9							1			1		1								
98174	4	70			1		3	33	4	25		4							4			
98180	11	139			3	33	4	25	4	**		10		5			1		4	2		1
98185	2	10					1		1	**		2		1					1			
98192	2	13							2			2		2								
98195	1	4					1	**				1										1
98197	1	11							1			1		1								1
98209	12	160					7	43	5	60		12		1					3			
98210	12	179			2	50	5	80	5	20		12		4	2				4	2		
98218	1	5			1	**						1		5	1							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

,798
JAN-JUN 1979

SAMPLE HOSPITAL - ANYTOWN, USA

CLASSIFICATION OF PATIENTS LOCALITY CODE, ATTENDING PHYSICIAN 1	TOTALS PATIENTS 2	 DAYS 3	PATIENTS BY AGE AND % MALE 4	 % 5	 6	 % 7	 8	 % 9	 10	 % 11	PATIENTS BY 12	 13	 14	PATIENTS BY EXPECTED SOURCE OF PRINCIPAL PAYMENT Medicare 15	 Medicaid 16	 Title V (M & CH) 17	 Other Govt 18	 Workers Comp 19	 Blue Cross 20	 Insurance Company 21	 Self-Payment 22	 Other 23
63250																						
131																						
162																						
352																						
412																						
413																						
584																						
809																						
815																						
962																						
998																						
NO VALID ENTRY																						
TOTAL																						
63255																						
206																						
311																						
808																						
924																						
980																						
NO VALID ENTRY																						
TOTAL																						
63256																						
611																						
NO VALID ENTRY																						
TOTAL																						
63301																						
121																						
142																						
341																						
502																						
513																						
518																						
832																						
962																						
NO VALID ENTRY																						
TOTAL																						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

PATIENT CARE SUMMARY

BASIC DATA

INVESTIGATION

PCS1

P1 Form Column Number	Column(s)* Used as Base for Percent
3	2
6	
8	
9	
10	2-11‡
11	2
12	2-13‡
13	2
14	2-15‡
15	2
16	2-118‡
17	2-19‡
18	2-19‡
19	2
20	2-118‡
21	2
22	2
23	22
24	2
25	
26	
27	
28	
29	29
30	2
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	

‡ means that the difference of the column totals is used for the base.

*In all percentage calculations patients without the relevant item recorded are excluded from the numerator and denominator.

PATIENT CARE SUMMARY

CPHA

PATIENT GROUP (Each Patient is Entered For) / SUMMARY DIAGNOSIS GROUP (1 Group Number and Name (ICD 8 CM codes are on back of form))	TOTAL PATIENTS: Number (7)	TOTAL PATIENTS: Percent Males (3)	PERCENTILE STAY IN DAYS (EXCL. DEATHS): 50th (median) (4)	PERCENTILE STAY IN DAYS (EXCL. DEATHS): 75th (5)	PATIENTS 65 AND OLDER: Number (6)	PATIENTS 65 AND OLDER: Median Stay (excl. deaths) (7)	% (over) emergency admissions (8)	Number of Deaths (9)	ADMISSION PERIOD Number of Patients with: WBC COUNT 10,000 or Over (10)	WBC COUNT Not Done (11)	< (12)	Not Done (13)	BLOOD PRESSURE Diastolic 120 mm or Over (14)	BLOOD PRESSURE Not Done (15)	TEMP 100 F (38 C) or Over (16)	URINALYSIS: Sugar Positive (17)	URINALYSIS: Protein Positive (18)	URINALYSIS: Not Done (19)	Atabrine Administered with Later Fever (20)	Minimum Lab Not Met (21)	X-RAYS: Chest (22)	X-RAYS: Repeat Chest (23)	X-RAYS: Skeletal (24)	X-RAYS: Upper GI and Small Bowel (25)	X-RAYS: Lower GI (26)	X-RAYS: Biliary (27)	X-RAYS: Urogenital (28)	FUNCTION TESTS: ECG (29)	FUNCTION TESTS: Repeat ECG (30)	FUNCTION TESTS: Pulmonary (31)	FUNCTION TESTS: Kidney (32)	FUNCTION TESTS: Gastric (33)	MICROBIOLOGY: Bacterial Smear (34)	MICROBIOLOGY: CULTURES: ENT (35)	MICROBIOLOGY: CULTURES: GU (36)	MICROBIOLOGY: CULTURES: Lower Resp (37)	MICROBIOLOGY: CULTURES: Blood (38)	MICROBIOLOGY: CULTURES: Skin (39)	MICROBIOLOGY: Culture and Sensitivity (40)	% Patients with Contributing Factors (41)	OPTIONAL (42)
OVERALL PERCENTS →																																												
GRAND TOTAL																																												
1 Infective																																												
2 Malignant Neoplasm																																												
3 Other Neoplasm																																												
4 Diabetes Mellitus																																												
5 Other Endocrine Metabolic																																												
6 Hematologic																																												
7 Mental																																												
8 Nervous System																																												
9 Eye																																												
10 Ear																																												
11 Hypertension																																												
12 Acute Myocardial Infarction																																												
13 Other Ischemic Heart																																												
14 Other Heart																																												
15 Cerebrovascular																																												
16 Other Vascular																																												
17 Pneumonia																																												
18 Bronchitis, COPD, Asthma																																												
19 Hypertrophy of T & A																																												
20 Other Respiratory																																												
21 Dental																																												
22 Peptic Ulcer																																												
23 Other and Upper G.I.																																												
24 Appendix																																												
25 Hernia																																												
26 Biliary Tract Disease																																												
27 Urinary																																												
28 Male Genital																																												
29 Breast																																												
30 Female Genital																																												
31 Complication of Pregnancy																																												
32 Abortion																																												
33 Normal Delivery																																												
34 Complicated Delivery																																												
35 Complication of Puerperium																																												
36 Skin																																												
37 Musculoskeletal																																												
38 Congenital Anomaly																																												
39 Diseases of Infancy																																												
40 Symptoms, Signs																																												
41 Fracture																																												
42 Other Trauma																																												
43 Adverse Effects																																												
44 Special Conditions																																												
45 Newborn																																												
46 Invalid/Unrecorded																																												

AGE GROUP (93)	TOTAL PATIENTS (94)	AVG STAY (95)	% MALES (96)	ADMISSIONS (PATIENT): Elective (97)	Thru ER (98)	From SNF or Acute (99)	TRANSFERRED TO: Skilled Inter. Nursing (100)	Skilled Nursing (101)	Intermed. Care (102)	Home Health (103)	Other Facility (104)	PERCENT OF PATIENTS WITH EXAMS: Fundus copic (105)	Rectal (106)	Females with: Pelvic (107)	Cerv. Pap (108)	STS (109)	Multi Phasic Chem Tech (110)	CBC (111)	DEATHS: Number (112)	Autopsied (113)	114 In OR	115 Post-Op After Op	116 3d Day or Later	Number	Minimum Lab Not Met %	OTHER OUTCOMES (PLACEMENT): 117 Adults: Other Med Supvs Stable; Normal GI Func; Normal Urinary Func; HGB OK	Lack of Pt Complaint; Ambulatory; Conscious; Progress Satisfactory; Check Item Understood	118 TOTAL WORKUP: No Adm Temp; No Weight; No Urinalysis; No Hgb or Hct; No WBC Count	119 < : Pts; Transfused: %; 120 ≥ : Pts; Transfused: %; 121 Non Op Pts with Fluids Without Electrolyte Determination %	122 PATIENTS GIVEN ANTIBIOTICS: Total; Without Culture	123 PATIENTS GIVEN OTHER ANTI-INFEC: Total; Without Culture	124 PATIENTS WITH X-RAYS: Pleural, Parthenoat; CNS; Cardio-vascular; Mammo-gram; IVP

PCS$_2$ — INVESTIGATION (cont) — MANAGEMENT — PATIENT CARE SUMMARY

Group Number (same as col-umn 1)	Total Patients (same as col-umn 2)	PATIENTS WITH BLOOD CHEMISTRY: Blood Glucose	Nitrogen Deriva-tives	Calcium, Phos-phorus	Na, K, Cl, CO_2, pH	Liver Function	Thyroid Function	Trans-aminase, LDH	Chol-esterol, lipids	Proteins, Protein Electro-phoresis	PATIENTS WITH OTHER TESTS: Ar-terial Blood Gases	Trans-Sort or Cell Block	Stool for Blood	Coag-ula-tion	ALL OPERATED PATIENTS: Number of Patients	PERCENT OPERATED FIRST 2 DAYS: With-in 6 hrs	After 6 hrs	% with Gen'l Anes-thesia	TISSUE OF MOST IMPORTANT OPERATION: Number Recorded	% Normal	BLOOD TRANSFUSIONS (INCLUDES WHOLE BLOOD AND PACKED RBC): Total Patients	PATIENTS WITH: 1 Unit	2 Units	UNITS: Total	% Packed RBC	PATIENTS GIVEN: Plas-ma, Blood Deriv-atives	Paren-teral Fluids	Care in ICU or CCU	Oxygen	Other Inhal Rx	Moni-tors	Phys-ical Ther-apy	In-dwelling Urinary Catheter	Spe-cial J	Spe-cial K	PATIENTS GIVEN DRUGS: Oral Anti-dia-betics	Insu-lin	Hypo-tensives	Diuretics	ACTH Cort-icoids	Other Hormones	Cardiac Regu-lators	Anti-coagu-lants	Anti-biotics	Sulfas, Other Anti-infectives	Anore-tyca	Neuro-leptics	Spe-cial II	Spe-cial I
43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
PERCENTS →																																																	
GRAND TOTAL																																																
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50																																																

PATIENTS GIVEN (125): IPPB; Radiation Therapy; Ultrasound; Scan

PATIENTS WITH ENDOSCOPY (126): Bronchoscopy; Laryngoscopy; Cystoscopy; Proctoscopy; Esophago-gastroscopy; Culdoscopy

SPECIAL (127): A | B | C | D | E | F

ANTICOAGULANTS (128): PATIENTS: Low Hgb or Hct; No Coag Test

Adm & Prin DX Same (129)

DIURETICS (130): PATIENTS: No Blood Pressure; No Weight; No Urine Test; No Electrolyte Determination

DIASTOLIC BP ≥ 120mm (131): PATIENTS: No Diagnosis of Hypertension; No Diuretics; No Hypotensives; No Diuretics or Hypotensives

Packed RBC Patients as % of All Patients Transfused (132)

INDWELLING URINARY CATH (133): PATIENTS: No Admission Urinalysis; No Repeat Urinalysis; Peak Temp ≥ 101 F (38.5 C) Number; No Urine Culture

Blood Glucose (134): Blood Glucose Abnormal; Abnormal Sugar, No Diabetic or Hypoglycemic DX Number; Without GTT

OPERATED PTS OVER 40 (135): PATIENTS: No Chest X-ray; No ECG; No Blood Sugar; No Nitrogen Deriv

DATA BY DAY OF ADMISSION AND DISCHARGE (138)

	Adm Pts.	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Geometric mean stay by day of admission								
Is mean stay signifi-cantly different from								
% Admitted on								
% Discharged on								
% Operated on day of ad-mission or day after								

P_2 Form Column Number	Columns * Used as Base for Percent
45	
46	
47	
48	
49	
50	
51	44
52	
53	
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* In all percentage calculations patients without the relevant item recorded are excluded from the numerator and the denominator.

PATIENT CARE SUMMARY

CPHA

Printed in U.S.A.

Form 948

CPHA

INDIVIDUAL CASE LISTING — BA DAT

…AS
Professional Activity Study

eriod:

	DIAGNOSES: INDEXED DIAGNOSIS (ICD-9-CM)	OTHER DIAGNOSES (ICD-9-CM)				OPERATIVE EPISODES: TIME: WITHIN 6 HRS	HOSPITAL DAY	INDEXED PROCEDURE (ICD-9-CM)	TISSUE OF COL. 8	OTHER PROCEDURE (ICD-9-CM)	TISSUE OF COL 10	OTHER PROCEDURE (ICD-9-CM)	TISSUE OF COL. 12	OTHER PROCEDURE (ICD-9-CM)	TISSUE OF COL. 14	OTHER PROCEDURE (ICD-9-CM)	TISSUE OF COL. 16	SURGEON	ATTENDING PHYSICIAN	CONSULTATION	SELECTED CASE	AGE	RACE	SEX	ADMISSION HOUR	ADMISSION TYPE	DISPOSITION	HOSPITAL SERVICE	DISCH MONTH	STAY	DAYS IN CARE UNIT	PAYMENT: PRINCIPAL	SECONDARY: MCARE/COMP/IN	MCAID/B CROSS/?	OGOVT/SELF/OTH	LOCALITY CODE	OPTIONAL: SPECIAL A/B/C	SPECIAL D/E/F		PATIENT NUMBER
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
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SAMPLE REPORT

Date Prepared:

Time Period:

Page of

CPHA

INDIVIDUAL CASE LISTING - QUALITY CONTROL DATA

PAS
Professional Activity Study

Time Period:

SAMPLE REPORT

PATIENT NUMBER	ADMISSION					HEMATOLOGY				SEROLOGY		
	HGB/HCT	WBC	BLOOD PRESSURE	URINALYSIS	TEMPERATURE	CBC	RBC INDEX/RETIC	RBC ABN/SEDRATE	COAG/PLATELETS	STS/RHEUM FAC	BACT/HUMAN AB	IRON/AMYLASE
1	2	3	4	5	6	7	8	9	10	11	12	13

INVESTIGATION: BLOOD CHEMISTRY										FUNC			X-RAY			
GTT/ART GASES	NITROGEN DERIV	CALCIUM/PHOS	ELECTROLYTES	ENZYMES	PROTEINS	CHOLESTEROL	GLUCOSE	LIVER FUNCTION	THYROID FUNCTION	ECG	CARDIO/PULM	KIDNEY/EEG	CHEST/REPEAT	UPPER. LOWER GI	BILIARY/UROGEN	SKEL/PLEURAL
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

MICRO: CULTURE													
ENT/SPUTUM	WOUND/BLOOD	UROGEN/STOOL	C & S/SMEAR	PARASIT/FROZ SEC	MINIMUM LAB	RENIN/TOXICOL	FUNDUS/WEIGHT	RECTAL/PELVIC	REPEAT UA/HORM	UA SUG + PROT +	TB/OTHER SKIN	STOOL BLD/SPEC G
31	32	33	34	35	36	37	38	39	40	41	42	43

MANAGEMENT: DRUGS									UNITS OF BLOOD							STATUS AT DISCHARGE				
ANTIDIABETIC	DIUR/HYPOTENS	CARDIAC	SPEC H/SPEC I	ACTH/OTH HORM	ANTI-INFECTIVE	ANXIOLY/NEUROLEP	OPERATED	ANESTHESIA	TOTAL BLOOD	PACKED RBCS	I-O/OXYGEN	IPPB/OTHER INHAL	MONITOR/ISOLATION	FLUIDS/PLASMA	SPEC J/SPEC K	VITAL SIGNS OK	GU/URINARY OK	HGB OK/COMPLAINT?	CONSCIOUS/AMBUL	PROGRESS/INSTR
44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64

OPTIONAL DATA: RESEARCH																
C	D	54 a	54 b	54 c	55 abc	56 a	56 b	56 c	57 abc	58 a	58 b	58 c	59 abc	60 a	60 b	60 c
65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81

Date Prepared:

Time Period:

CPHA

INDIVIDUAL CASE LISTING - OPTIONAL DATA - BASIC

Professional Activity Study

Page

Period:

PATIENT NUMBER	INDEXED DIAGNOSIS	INDEXED PROCEDURE	ATTENDING PHYSICIAN	SURGEON OF INDEXED PROCEDURE	OPTIONAL DATA ITEMS													FOR HOSPITAL USE	OPTIONAL SEQUENCE
					RESEARCH		37	38	39	40	40	41	41	42	43	44	45	46	
					A	B	abcd	abcd	abc	a	b	a	b	abcde	abcdef	abcde	ab	ab	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Date Prepared:

Time Period:

Appendix F

This appendix contains examples of the clinical indicators developed by CPHA based on the relatively limited data set contained in the PAS database.

QUALITY INDICATOR REPORT
HOSPITAL WIDE

HOSPITAL: NAME NOT AVALIABLE (9999)
REGION: NORTHCENTRAL
CURRENT TIME PERIOD: JAN - MAR 90
PRIOR TIME PERIOD:

09/13/90

INDICATOR	HOSPITAL CURRENT NUMBER	HOSPITAL CURRENT %	HOSPITAL PREVIOUS NUMBER	HOSPITAL PREVIOUS %	REGION NUMBER	REGION %	REGION SIGNIF	TOTAL U.S. NUMBER	TOTAL U.S. %	TOTAL U.S. SIGNIF
ALL PATIENTS	6,015				12,218,444			34,333,620		
MEDICAL PTS	2,769				5,269,028			14,170,222		
SURGICAL PTS	1,166				2,669,711			7,891,641		
PEDIATRIC PTS	430				1,016,210			2,475,307		
OBSTETRIC PTS	670				1,521,879			4,656,759		
NEWBORN/NEONATES	592				1,415,812			4,234,814		
PSYCH/SUBSTANCE ABUSE	388				325,801			904,875		
1. TOTAL DEATHS	**215**	**3.8**			**354,672**	**3.0**	**?**	**972,867**	**2.9**	**?**
AGE 0 - 18 YEARS, WITH CC CODE	1				14,502	.1		32,846	.1	
AGE 0 - 18 YEARS, WITH NO CC CODE	1				2,412			5,925		
AGE 19 - 44 YEARS, WITH CC CODE	13	.2			17,661	.1		50,425	.2	
AGE 19 - 44 YEARS, WITH NO CC CODE					2,152			5,356		
AGE 45 - 64 YEARS, WITH CC CODE	32	.6			60,053	.5		167,622	.5	
AGE 45 - 64 YEARS, WITH NO CC CODE	2				4,975			12,728		
AGE 65 YRS OR OLDER, WITH CC CODE	**157**	**2.8**			**236,984**	**2.0**	**?**	**658,027**	**2.0**	**?**
AGE 65 YRS OR OLDER, WITH NO CC CODE	9	.2			15,928	.1		41,733	.1	
MEDICAL PTS	**179**	**7.1**			**273,387**	**5.4**	**?**	**743,738**	**5.5**	**?**
AGE 19 - 44 YEARS, WITH CC CODE	11	.4			12,611	.3		36,305	.3	
AGE 19 - 44 YEARS, WITH NO CC CODE					1,604			3,957		
AGE 45 - 64 YEARS, WITH CC CODE	27	1.1			47,157	.9		129,558	1.0	
AGE 45 - 64 YEARS, WITH NO CC CODE	2	.1			4,341	.1		11,004	.1	
AGE 65 YRS OR OLDER, WITH CC CODE	**131**	**5.2**			**193,205**	**3.8**	**?**	**525,143**	**3.9**	**?**
AGE 65 YRS OR OLDER, WITH NO CC CODE	8	.3			14,448	.3		37,769	.3	
SURGICAL PTS	34	3.0			62,841	2.4		186,557	2.4	
AGE 19 - 44 YEARS, WITH CC CODE	2	.2			4,928	.2		13,513	.2	
AGE 19 - 44 YEARS, WITH NO CC CODE					403			1,158		
AGE 45 - 64 YEARS, WITH CC CODE	5	.4			12,693	.5		37,566	.5	
AGE 45 - 64 YEARS, WITH NO CC CODE					610			1,678		
AGE 65 YRS OR OLDER, WITH CC CODE	26	2.3			42,816	1.6		128,841	1.6	
AGE 65 YRS OR OLDER, WITH NO CC CODE	1	.1			1,390	.1		3,799		
PEDIATRIC PTS					5,557	.6		11,071	.5	
OBSTETRIC PTS	2	.3			272			687		
NEWBORN/NEONATES					11,297	.8		27,601	.7	
PSYCH/SUBSTANCE ABUSE					1,335	.4		3,010	.4	
2. * STILLBORN	2	.3			840	.4		2,034	.3	

PA01-09-90 + and ? indicate a statistically significantly ($P < 0.05$) difference from the relevant norm.

+ indicates the difference is suggestive of higher quality (i.e., fewer medical misadvantures).
* indicates a statistically significant difference with no clear implication for hospital quality.

DATE PREPARED 09/14/90
HHWP844L

PATIENT LISTING
HOSPITAL WIDE QUALITY ASSURANCE INDICATOR REPORT
9999 NAME NOT AVAILABLE
8910 - 9003
PREPARED BY HEALTHCARE KNOWLEDGE SYSTEMS

30. PTS. WITH A DECUBITUS ULCER
MEDICAL PTS (INCL PSYCH)

MEDICAL RECORD#	DISCH DATE	AGE	SEX	LOS	DRG	ATT. PHY.	ADM STAT	DISP	SPEC CARE	DX (CODE & TITLE)	SURG. PX (CODE & TITLE)
000619650	02-10-90	66Y	F	0008	320	00245	T R	HHS	O	5990 URIN TRACT INFECTION NOS 2765 HYPOVOLEMIA 7070 DECUBITUS ULCER 340 MULTIPLE SCLEROSIS 34461 NEUROGENIC BLADDER 7538 CYSTOURETHRAL ANOM NEC 1122 CANDIDIAS UROGENITAL NEC 0414 E. COLI INFECT NOS	00245 5732 CYSTOSCOPY NEC 8922 CYSTOMETROGRAM 8875 DX ULTRASOUND-URINARY
000663153	01-19-90	94Y	F	0017	416	00013	S T	SNF	O	0381 STAPHYLOCOCC SEPTICEMIA 2765 HYPOVOLEMIA 7070 DECUBITUS ULCER 4140 CORONARY ATHEROSCLEROSIS V125 HX-CIRCULATORY SYS DIS	00013 8954 ELECTROCARDIOGRAPH MONIT 8965 ARTERIAL BLD GAS MEASURE
000663153	01-25-90	94Y	F	0004	416	00013	S T R	D	O	0381 STAPHYLOCOCC SEPTICEMIA 486 PNEUMONIA, ORGANISM NOS 2765 HYPOVOLEMIA 5990 URIN TRACT INFECTION NOS 2768 HYPOPOTASSEMIA 7070 DECUBITUS ULCER 4140 CORONARY ATHEROSCLEROSIS 3429 HEMIPLEGIA NOS 438 LATE EFF CEREBROVASC DIS 0411 STAPH INFECTION NOS 0410 STREPTOCOCCUS INFECT NOS 2859 ANEMIA NOS	00013 966 ENTERAL NUTRITION 8954 ELECTROCARDIOGRAPH MONIT 8965 ARTERIAL BLD GAS MEASURE
000900211	12-08-89	87Y	F	0018	089	20125	E	HOME	O	486 PNEUMONIA, ORGANISM NOS 51882 OTHER PULMONARY INSUFF 4280 CONGESTIVE HEART FAILURE 7070 DECUBITUS ULCER 2639 PROTEIN-CAL MALNUTR NOS 5990 URIN TRACT INFECTION NOS 3320 PARALYSIS AGITANS 25000 DIABETES UNCOMPL ADULT 81221 FX HUMERUS SHAFT-CLOSED 4140 CORONARY ATHEROSCLEROSIS 3109 NONPSYCHOT BRAIN SYN NOS	4513 SM BOWEL ENDOSCOPY NEC 9383 OCCUPATIONAL THERAPY 9339 PHYSICAL THERAPY NEC 40304 4311 PERCUTANEOUS GASTROSTOMY

HEALTHCARE KNOWLEDGE RESOURCES

HOSPITAL-WIDE QUALITY INDICATORS

1. Total deaths.
2. Stillborn.
3. Deaths within 2 days.
4. Autopsied patients.
5. Patient misadventures.
6. Hospital incurred trauma.
7. Hospital incurred trauma, expired.
8. Misadventure during/from OR procedure.
9. Patient expired within 48 hours of anesthesia.
10. Patients with a post-op wound infection.
11. Operated patients with pneumonia.
12. Patients with a transfusion reaction.
13. Central venous line + infection/septicemia.
14. Intravascular device-Associated infection.
15. Infection, intravascular device, SCU.
16. Hysterectomy, age less than 35 years.
17. Hysterectomy, age less than 35 years, no history of cancer.
18. Cardiac arrest, not Principal Diagnosis.
19. Cardiac arrest, expired, not Principal Diagnosis.
20. Respiratory arrest, not Principal Diagnosis.
21. Respiratory arrest, expired, not Principal Diagnosis.
22. Organ failure, not Principal Diagnosis.

3853 Research Park Drive, P.O. Box 303, Ann Arbor, MI 48106-0303 (313)930-7830

23. Organ failure, not Principal Diagnosis, expired.
24. CHF, not Principal Diagnosis.
25. CHF, not Principal Diagnosis, expired.
26. Pneumonia, not reason for admission.
27. Pneumonia, in SCU, not reason for admission.
28. URI, bronchiolitis, pneumonia and DRG outlier.
29. Respirator patients/Respiratory infection.
30. Patients with a decubitus ulcer.
31. Patients admitted from SNF, with a decubitus ulcer.
32. Accidental poisoning by medications.
33. Other accidental poisoning.
34. Suicide and self inflicted injury.
35. Adverse effects/Therapeutic substances.
36. Patients with Principal Diagnosis of sign/symptom
37. Readmission-Hospital defined.
38. Admitted from other acute hospital.
39. Admitted from other acute hospital, expired.
40. Admitted from Skilled Nursing Facility (SNF).
41. Patients admitted from SNF, expired.
42. Discharged against medical advice (AMA).
43. Transferred to other acute care hospital.
44. Trauma patients, transferred to other acute care hospital.
45. Trauma patients, expired.
46. Patients with complication/comorbidity (CC) code.
47. Average number of CC codes.
48. DRG outliers.
49. Average length of stay.

50. Patient length of stay: 1 day or less
51. Patient length of stay: 2 days
52. Patient length of stay: 3 days
53. Patient length of stay: 4 - 13 days
54. Patient length of stay: 4 - 13 days, DRG outlier
55. Patient length of stay: 14 - 29 days
56. Patient length of stay: 14 - 29 days, DRG outlier
57. Patient length of stay: 30 - 44 days
58. Patient LOS: 30 - 44 days, DRG outlier
59. Patient length of stay: 45 days or greater
60. Patient length of stay: 45 days or greater, DRG outlier

OBSTETRICAL QUALITY INDICATORS

1. Abortion and Obstetrical patients included in this report.
2. Average length of stay all AB/OB patients.
3. Average length of stay of all OB not delivered patients.
4. Average length of stay of all OB delivered patients.
5. Average length of stay of all vaginal delivery patients.
6. Average length of stay of all C-Section delivery patients.
7. DRG length of stay outlier (AB/OB Pts).
8. DRG length of stay outliers - OB not delivered patients.
9. DRG length of stay outliers - OB delivered patients.
10. DRG length of stay outliers - vaginal deliveries.
11. DRG length of stay outliers - C-Section deliveries.
12. OB patients expired: all OB records with a disposition code of 22B1.
13. OB patients transferred to acute care hospital.
14. OB patients with postpartum complications.
15. Postpartum patients with hemorrhage.
16. Postpartum hemorrhage, hysterectomy.
17. Number of ectopic pregnancies.
18. Number of ectopic pregnancies, expired.
19. Number of incomplete abortions.
20. Spontaneous abortions.
21. Legally induced abortions.
22. Legally induced abortion with infection.
23. Legally induced abortion with hemorrhage.
24. Failed abortion attempts.
25. OB patient misadventures.
26. Placenta previa, no hemorrhage.

27. Placenta previa with hemorrhage.
28. Premature separation of the placenta.
29. Antepart. hemorrhage due to coag. defects.
30. Other/unspecified antepartum hemorrhage.
31. Patients with pre-eclampsia.
32. Patients with pre-eclampsia, expired.
33. Patients with eclampsia.
34. Patients with eclampsia, expired.
35. Eclampsia patients with pre-existing hypertension.
36. Patients with pre-eclampsia/eclampsia, DRG outlier.
37. OB patients with bleeding, DRG outlier.
38. Premature labor, DRG outlier.
39. OB patients with cardiac arrest.
40. OB not delivered patients.
41. OB delivered patients.
42. OB delivered patients expired.
43. Post delivery complications.
44. OB delivery malposition/malpresentation.
45. OB delivery CNS malformation.
46. OB delivery, fetal chromosomal abnormality.
47. Retain placenta/membranes, no hemorrhage.
48. Pulmonary comps due to anesthetic/sedation.
49. Cardiac comps due to anesthetic/sedation.
50. OB delivery, CNS comps due to anesthetic/sedation.
51. OB delivery, other/unspecified comps due to anesthetic/sedation.
52. OB delivered, maternal distress.
53. OB delivered, obstetrical shock.

54. OB delivered patients, hypotension.

55. OB delivered, acute renal failure.

56. OB delivered, other complications.

57. Forceps/vacuum extractor del, no indication.

58. Breech extraction, without indication.

59. OB delivery, major puerperal infection.

60. OB delivery, venous complications.

61. OB delivery, obstetrical pulmonary embolism.

62. OB delivery, multiple births.

63. OB delivery, one or more stillborn.

64. OB delivered with umbilical cord complications.

65. OB delivered, cord comps, fetal distress.

66. Suspected/known fetal damage due to drugs.

67. Suspected/known fetal damage due to other causes.

68. OB delivery, fetal distress.

69. Patients with preterm delivery.

70. Preterm delivery, fetus died.

71. OB delivery, poor fetal growth.

72. OB delivery, poor fetal growth, c-section.

73. OB delivery, excessive fetal growth.

74. Excessive fetal growth, vaginal delivery.

75. OB delivery, abnormal conditions of the placenta.

76. OB delivery, elderly primagravida.

77. Elderly primagrav, KWN/SUSP fetal problems.

78. Elderly primigravida, stillborn fetus.

79. Vaginally delivered patients with a LOS of greater than two days.

80. Vaginal delivery, previous c-section.

81. Low forcep deliveries.
82. Mid forceps deliveries.
83. High forceps deliveries.
84. Breech forceps deliveries.
85. OB delivered, perineal lacerations.
86. OB delivered, other obstetrical trauma.
87. C-section patient, LOS greater than four days.
88. Repeat c-section patients.
89. C-section without indication.
90. C-section without indication, fetus light for dates.
91. Repeat c-section, failed trial of labor.
92. OB delivered, C-Section/Placental Comps.
93. OB delivered, C-Section/Pre-eclampsia, Eclampsia.
94. OB delivered, C-Section/Multiple Births.
95. OB delivered, C-Section/Malposition-Presentation.
96. C-Section/Pelvic, fetopelvic, fetal disproportion
97. C-Section, fetus large for dates.
98. C-Section, fetal distress.

smb:RB28 (revised 5-15-90 by PM:mlh)

QUALITY INDICATOR REPORTS
Data Elements

1. Hospital Identification
2. Discharge Date
3. Patient Number (Medical Record Number)
4. Date of Birth
5. Admission Date
6. Attending Physician
7. Birth Weight
8. Sex
9. Disposition
10. Stillborn
11. Expected Principal Source of Payment
12. Admission Source
13. Principal Diagnosis
14. Additional Diagnoses (include all occurrences)
15. Principal Procedure
16. OP Physician of Principal Procedure
17. Date of Principal Procedure
18. Additional Procedures (include all occurrences)
19. OP Physician(s) of each Additional Procedure Recorded
20. Date(s) of each Additional Procedure Recorded
21. Care Unit Days: Intensive Care, Cardiac Care, Special Care
22. Locality/Zip Code *
23. Total Charges *

* Optional

Healthcare Knowledge Resources 3853 Research Park Drive, P.O. Box 303, Ann Arbor, MI 48106-0303

Appendix G

This appendix contains details of the development of the three risk adjusted quality measures - RAMI, RACI, RARI - and some example reports using the indexes.

HEALTHCARE KNOWLEDGE SYSTEMS

Quality Assessment Program

Healthcare Knowledge Systems
1968 Green Road
Ann Arbor, Michigan 48106

HKS Quality Assessment Program
Across-Facility Comparative Table
January-December 1989

Facility Number	Total N	N	RACI	RAMI	RARI	Composite Index
294	1122	932	0.60	0.72	**0.48++**	**0.57++**
223	798	706	**0.41++**	0.93	**0.59+**	**0.61++**
222	939	914	1.23	0.45	**0.52++**	**0.64++**
235	1215	1015	**0.46++**	**0.31++**	0.95	**0.69++**
242	3083	2953	0.90	**0.51++**	**0.69++**	**0.72++**
234	1136	1091	0.77	0.74	**0.73+**	**0.74++**
283	3689	3006	**0.61++**	0.84	0.93	**0.81++**
331	3847	3638	1.04	**0.69++**	**0.69++**	**0.82++**
356	7446	5934	**0.58++**	**1.19 -**	0.92	**0.87++**
262	658	626	0.39	0.56	0.82	**0.68+**
153	1416	1382	0.84	0.79	**0.68+**	**0.74+**
227	3377	2851	0.83	**0.61++**	1.01	**0.87+**
190	269	252	1.29	0.90	0.52	0.76
189	386	362	1.24	0.81	0.60	0.80
224	1183	1159	0.80	0.84	0.87	0.85
282	1531	1120	0.73	**0.49+**	1.07	0.86
158	3144	2930	0.83	0.85	1.00	0.92
179	5505	5372	**0.74++**	1.01	**1.30 - -**	1.05
270	4097	3342	**1.43 - -**	**0.73+**	1.02	1.07
192	3142	2520	1.29	0.82	1.10	1.13
348	3796	3033	**1.90 - -**	0.83	**0.83+**	**1.16 - -**
177	12872	11353	**1.56 - -**	**0.65++**	**1.29 - -**	**1.22 - -**
346	4994	3598	**1.58 - -**	0.71	**1.43 - -**	**1.40 - -**

*An entry printed in **bold** type indicates the value printed is statistically significantly different from the expected value (as determined by a Poisson test). Good performance is shown by + (significant at p≤.05) or ++ (significant at p≤.01) and poor performance by - or - -.

HEALTHCARE KNOWLEDGE SYSTEMS

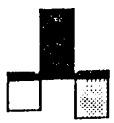
Quality Assessment Program
System Comparative Profile

January-December 1989

Risk-Adjusted Outcome Measures – 8 Hospitals Compared

Legend

RACI RAMI RARI



The leftmost bar for each facility represents the **Risk-Adjusted Complications Index (RACI).** The middle bar is the **Risk-Adjusted Mortality Index (RAMI).** The rightmost bar is the **Risk-Adjusted Readmission Index (RARI).**

The length of the bar above or below the line indicates each facility's percentage difference from HKS' national risk-adjusted norms for complication rate, mortality rate, and readmission rate. For example, a RAMI bar at the 1.50 mark indicates a mortality rate 50% higher than expected.

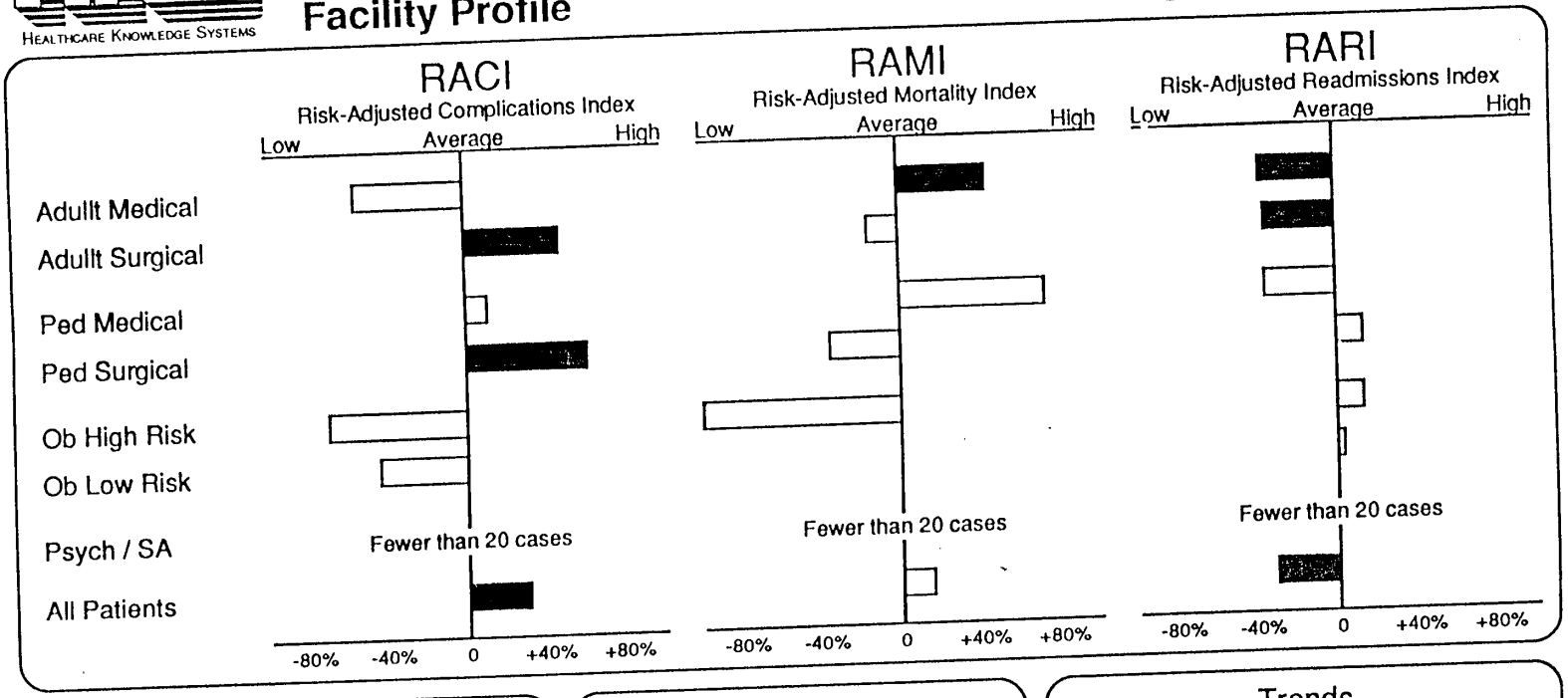
A shaded bar indicates that the observed difference is statistically significant at the $p<.05$ level (Poisson test).

A solid bar indicates that the observed difference is statistically significant at the $p<.01$ level (Poisson test).

HEALTHCARE KNOWLEDGE SYSTEMS

Quality Assessment Program
Facility Profile

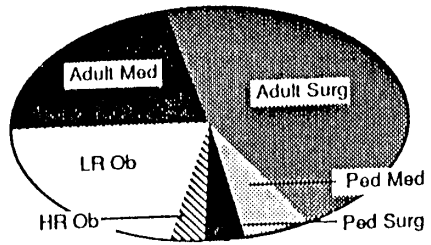
Facility 331
Claims Paid in 1989



Data Quality Indicators

	Actual	Standard
Invalid ICD-9-CM codes	61	0
Other coding errors	72	0
Total coding errors	133	0
		CPHA Norm
Errors as % of records	4.0%	0.04%
Diagnoses per discharge	2.9	3.6
Procedures per discharge	1.9	1.9

Service Mix



3,138 Cases (After Exclusions)

Trends

	Jan-Jun 89	Jul-Dec 89
RACI	1.13	0.85
RAMI	1.04	1.38
RARI	0.69	0.76
Overall	0.84	0.78

Quality Assessment Program • Facility Profile Notes

1. DATA EXCLUSIONS

In order to insure consistency in the analysis of risk-adjusted data, certain problem records plus patients with uncommon risk factors (e.g., AIDS patients, neonates) are excluded from analysis in this report. A record is excluded if it includes any of the following: incalculable age or LOS; LOS = 0, discharged alive; LOS > 365 days; unrecorded or invalid sex or disposition; transfers to another short-stay, general hospital; DRGs 385-391 (neonates), DRG 456 (burns, transferred), DRGs 468-470 and 477; plus any records identifiable as AIDS, stillborn, or ungroupable.

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(Service assignment is made after data exclusions are completed; see Section 2 for a description of exclusions.)

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Obstetric High Risk: Patients assigned to MDC 14 (Obstetrical), whose age is < 18 years or > 36 years or who have a coded comorbidity.
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ICD-9-CM diagnosis codes, developed by CPHA's clinical consultants, representing many postsurgical and postdelivery complications of care. Only codes which identify complications that occurred during the hospital stay itself are included.

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ICD-9-CM diagnosis codes identified by HCFA as complications or comorbidities, excluding those codes which CPHA's clinical consultants defined as complications.

* A Class 1 procedure is an ICD-9-CM procedure that is generally regarded as a "surgical" procedure, involving an operative or anesthetic risk or requiring special personnel, facilities, or equipment. CPHA nosologists maintain an up-to-date list of procedure class.

3. RISK-ADJUSTED OUTCOME MEASURES

A. RISK-ADJUSTED COMPLICATIONS INDEX (RACI)
Ratio of the actual number of discharges with complications to the expected number, taking into account differences in age (under 65, 65-74, 75+), the presence of comorbidities, and the DRG assigned.

B. RISK-ADJUSTED MORTALITY INDEX (RAMI)
Ratio of the actual number of deaths to the expected number. The expected number of deaths is calculated in 2 ways: 1) for cases in low-risk** DRGs, the model takes into account age (under 65, 65-74,75+), the presence of comorbidities, and the DRG assigned; 2) for cases in a high-risk DRG, a logistic regression model is used. In addition to the DRG assigned, the logistic model takes into account the patient's age, risk of death associated with the principal diagnosis, risk of death associated with first operative procedure, whether there were any secondary diagnoses, presence of any cancer except skin cancer as a secondary diagnosis, the risk associated with the comorbidity having the highest risk of death, and the number of secondary diagnoses where the risk of death was greater than the overall risk of the DRG cluster itself.

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Ratio of the actual number of unanticipated readmissions to any hospital (within 14 days of discharge) to the expected number. Readmissions which are ordinarily scheduled (such as bilateral elective surgery or chemotherapy) or unavoidable (e. g., multiple admissions for AIDS patients) are excluded from the analysis.

4. EXPECTED VALUES

Expected values for complications and mortality were derived from a stratified random sample of 400 hospitals (1,764,143 discharges) selected from CPHA's 1988 Length of Stay data base (consisting of 5,485,679 discharges from 1,107 hospitals). The sample was stratified by Census Region and, to the extent possible, by bedside (6-24 beds, 25-49, 50-99, 100-199, 200-299, 300-399, 400-499, 500+ beds).

Expected values for readmissions were derived from a similar stratified sample of 312 hospitals (1,476,861 discharges) with unit numbered medical records. All unit-numbered hospitals from the 400-hospital base used to derive expected complications and mortality were included, along with additional unit-numbered hospitals from the 1988 Length of Stay data base.

** To determine whether a DRG is low-risk or high-risk, CPHA's national comparative data base is used to calculate actual mortality for each DRG cluster (adjacent groups of similar DRGs). DRGs in clusters where the overall mortality rate is < 5% are considered low risk; those in clusters where overall mortality is >= 5% are considered high risk. Of the 329 clusters, 273 are low risk and 56 are high risk.

5. DATA QUALITY INDICATORS

Invalid ICD-9-CM Codes shows the total number of invalid (non-existent) diagnosis and procedure codes submitted on all records
Other Coding Errors is the number of times other coding errors are detected (e.g., principal diagnosis does not match age of newborn, C-section recorded but diagnosis is uncomplicated delivery).
Total Coding Errors is the sum of the preceding two indicators.

The standard for coding errors is zero. Because coding quality is a key factor in outcome measures that use ICD-9-CM codes, any variation from zero errors is considered significant.

Errors as a Percent of Records is Total Coding Errors expressed as a percentage of all records audited.
Diagnoses Per Discharge is the total number of all diagnoses (principal and secondary) divided by the total number of inpatient episodes reported.
Procedures Per Discharge is the total number of all procedures (principal and secondary) divided by the total number of inpatient episodes reported.

The last three measures compare the facility's performance to averages from a larger comparative data base. Unless otherwise indicated in the column heading, CPHA's national data base is used as the basis of the comparison group.

6. REPORTING CONVENTIONS

A. Statistical Significance is indicated in lines of text through the use of boldface type. On the bar graphs, significance is indicated by the shade of the bar: no shading = not significant, shaded = significant at p=.05, solid color = significant at p=.01). Poisson tests were used to test significance where the number of observed adverse events was less than 100. The normal approximation to the binomial distribution was used when the observed number of adverse events was 100 or more.

B. Values for the Risk-Adjusted Indices are not displayed on the bar graphs unless there are at least 20 cases in the relevant group.

C. The risk-adjusted outcome measures are all ratios, and as such have a lower bound of zero and no upper bound. The bar graphs represent these numbers as percentages above and below the standard (in each case, the standard is a ratio of 1.00 - where the number of observed adverse events is equal to the number expected.) An index score more than 100% larger than the standard (which is to say, a ratio greater than 2.00) is represented by a pointed bar.

HKS Quality Assessment Program

Facility Profile Table

Claims Paid in 1989

Facility 331

	Total N	N after Exclusions	Risk-Adjusted Complications Index Observed	Expected	Index	Risk-Adjusted Mortality Index Observed	Expected	Index
Adult Medical	629	612	3	6.83	0.44	51	35.90	**1.43++**
Adult Surgical	1411	1365	114	77.56	**1.47++**	24	28.32	0.85
Pediatric Medical	282	225	2	1.82	1.10	3	1.73	1.73
Pediatric Surgical	240	179	12	7.47	**1.61++**	2	3.13	0.64
High Risk Obstetric	165	146	1	3.30	0.30	0	0.05	
Low Risk Obstetric	619	610	3	5.37	0.56	0	0.00	
Psychiatric/Substance Abuse	1	1	0	0.01		0	0.00	
Facility Total	3347	3138	135	102.35	**1.31++**	80	69.14	1.16

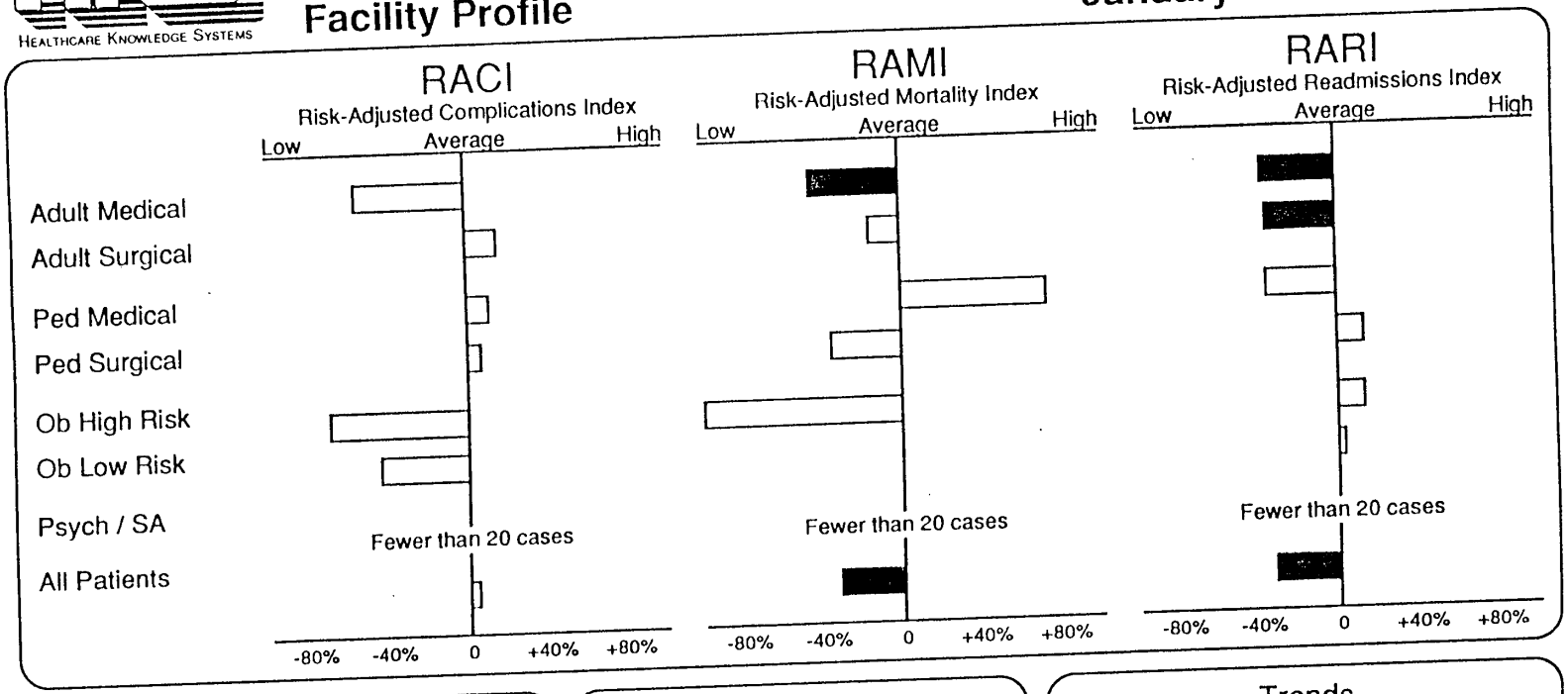
	Risk-Adjusted Readmission Index Observed	Expected	Index	Composite Risk-Adjusted Quality Index Observed	Expected	Index
Adult Medical	22	35.98	**0.61++**	44	78.71	**0.56++**
Adult Surgical	29	45.77	**0.63++**	142	151.65	0.94
Pediatric Medical	6	9.48	0.63	11	13.03	0.84
Pediatric Surgical	7	6.26	1.12	17	16.86	1.01
High Risk Obstetric	5	4.45	1.12	6	7.80	0.77
Low Risk Obstetric	4	3.92	1.02	7	9.29	0.75
Psychiatric/Substance Abuse	0	0.03		0	0.04	
Facility Total	73	105.89	**0.69++**	227	277.38	**0.82++**

*An entry printed in **bold** type indicates the value printed is statistically significantly different from the expected value (as determined by a Poisson test). Good performance is shown by + (significant at p≤.05) or ++ (significant at p≤.01) and poor performance by - or --.

HEALTHCARE KNOWLEDGE SYSTEMS

Quality Assessment Program
Facility Profile

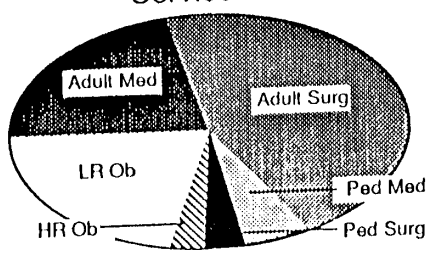
Facility 331
January-December 1989



Data Quality Indicators

	Actual	Standard
Invalid ICD-9-CM codes	61	0
Other coding errors	72	0
Total coding errors	133	0
		CPHA Norm
Errors as % of records	4.0%	0.04%
Diagnoses per discharge	2.9	3.6
Procedures per discharge	1.9	1.9

Service Mix



3,638 Cases (After Exclusions)

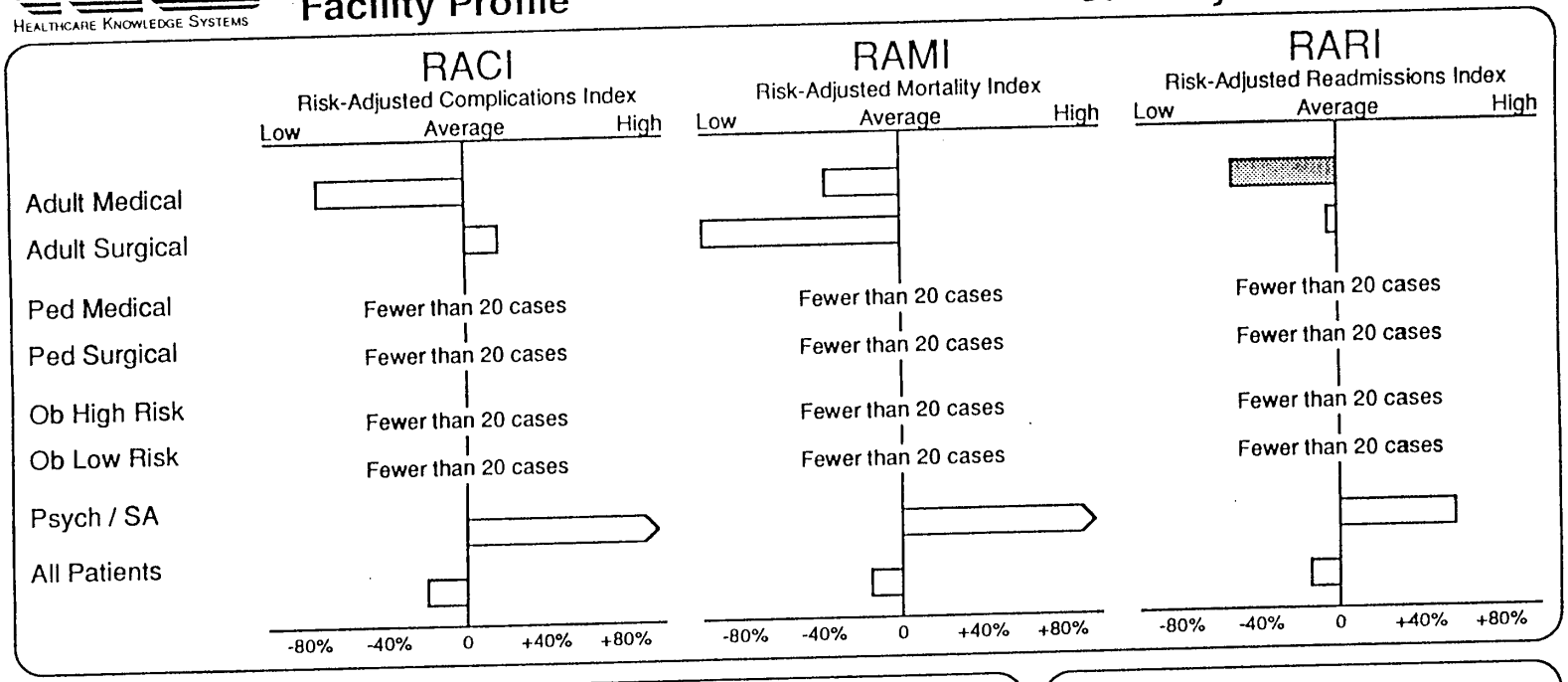
Trends

	Jan-Jun 89	Jul-Dec 89	
RACI	1.13	0.85	↓
RAMI	0.58	0.71	↑
RARI	0.69	0.76	↑
Overall	0.84	0.78	↓

HEALTHCARE KNOWLEDGE SYSTEMS

Quality Assessment Program
Facility Profile

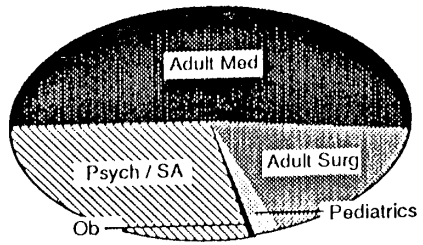
Facility 231
January-December 1989



Data Quality Indicators

	Actual	Standard
Invalid ICD-9-CM codes	60	0
Other coding errors	6	0
Total coding errors	66	0
		CPHA Norm
Errors as % of records	9.7%	0.04%
Diagnoses per discharge	3.1	3.6
Procedures per discharge	0.3	1.9

Service Mix



1,159 Cases (After Exclusions)

Trends

	Jan-Jun 89	Jul-Dec 89
RACI	0.00	1.37
RAMI	1.16	1.02
RARI	0.92	0.78
Overall	0.77	0.95

Quality Assessment Program - Facility Profile Notes

1. DATA EXCLUSIONS

In order to insure consistency in the analysis of risk-adjusted data, certain problem records plus patients with uncommon risk factors (e.g., AIDS patients, neonates) are excluded from analysis in this report. A record is excluded if it includes any of the following: incalculable age or LOS; LOS = 0, discharged alive; LOS > 365 days; unrecorded or invalid sex or disposition; transfers to another short-stay, general hospital; DRGs 385-391 (neonates), DRG 456 (burns, transferred), DRGs 468-470 and 477; plus any records identifiable as AIDS, stillborn, or ungroupable.

2. CLASSIFICATION OF PATIENTS

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(Service assignment is made after data exclusions are completed; see Section 2 for a description of exclusions.)

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ICD-9-CM diagnosis codes, developed by CPHA's clinical consultants, representing many postsurgical and postdelivery complications of care. Only codes which identify complications that occurred during the hospital stay itself are included.

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ICD-9-CM diagnosis codes identified by HCFA as complications or comorbidities, excluding those codes which CPHA's clinical consultants defined as complications.

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3. RISK-ADJUSTED OUTCOME MEASURES

A. RISK-ADJUSTED COMPLICATIONS INDEX (RACI)
Ratio of the actual number of discharges with complications to the expected number, taking into account differences in age (under 65, 65-74, 75+), the presence of comorbidities, and the DRG assigned.

B. RISK-ADJUSTED MORTALITY INDEX (RAMI)
Ratio of the actual number of deaths to the expected number. The expected number of deaths is calculated in 2 ways: 1) for cases in low-risk** DRGs, the model takes into account age (under 65, 65-74,75+), the presence of comorbidities, and the DRG assigned; 2) for cases in a high-risk DRG, a logistic regression model is used. In addition to the DRG assigned, the logistic model takes into account the patient's age, risk of death associated with the principal diagnosis, risk of death associated with first operative procedure, whether there were any secondary diagnoses, presence of any cancer except skin cancer as a secondary diagnosis, the risk associated with the comorbidity having the highest risk of death, and the number of secondary diagnoses where the risk of death was greater than the overall risk of the DRG cluster itself.

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Expected values for complications and mortality were derived from a stratified random sample of 400 hospitals (1,764,143 discharges) selected from CPHA's 1988 Length of Stay data base (consisting of 5,485,679 discharges from 1,107 hospitals). The sample was stratified by Census Region and, to the extent possible, by bedside (6-24 beds, 25-49, 50-99, 100-199, 200-299, 300-399, 400-499, 500+ beds).

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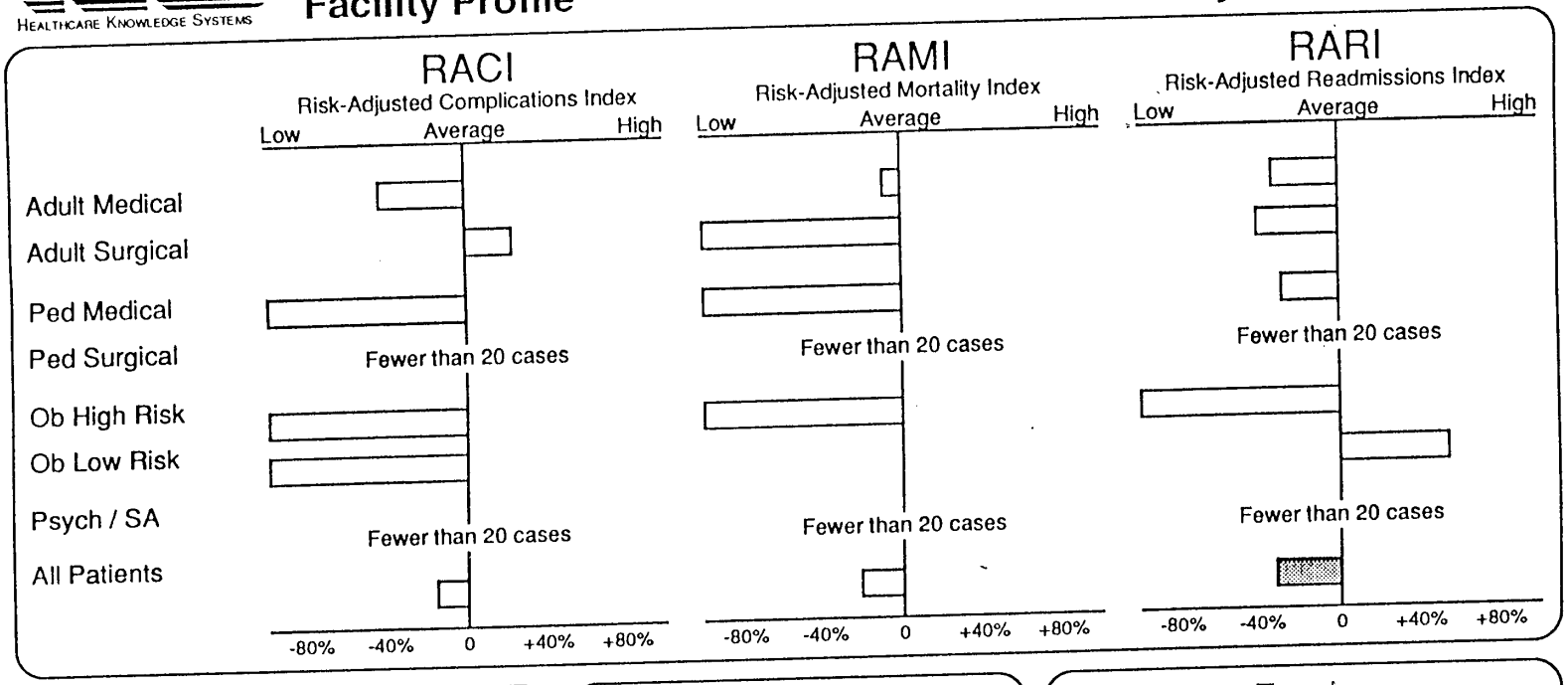
HEALTHCARE KNOWLEDGE SYSTEMS

Quality Assessment Program
Facility Profile

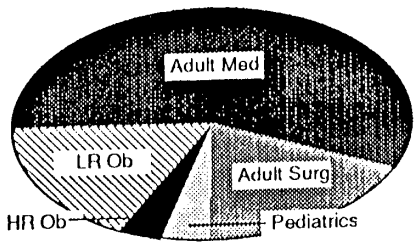
Facility 153
January-December 1989



Data Quality Indicators

	Actual	Standard
Invalid ICD-9-CM codes	9	0
Other coding errors	9	0
Total coding errors	18	0
		CPHA Norm
Errors as % of records	2.0%	0.04%
Diagnoses per discharge	3.0	3.6
Procedures per discharge	1.6	1.9

Service Mix



1,382 Cases (After Exclusions)

Trends

	Jan-Jun 89	Jul-Dec 89	
RACI	1.08	0.71	▽
RAMI	0.22	2.20	△
RARI	0.81	0.63	▽
Overall	0.77	0.82	△

Quality Assessment Program • Facility Profile Notes

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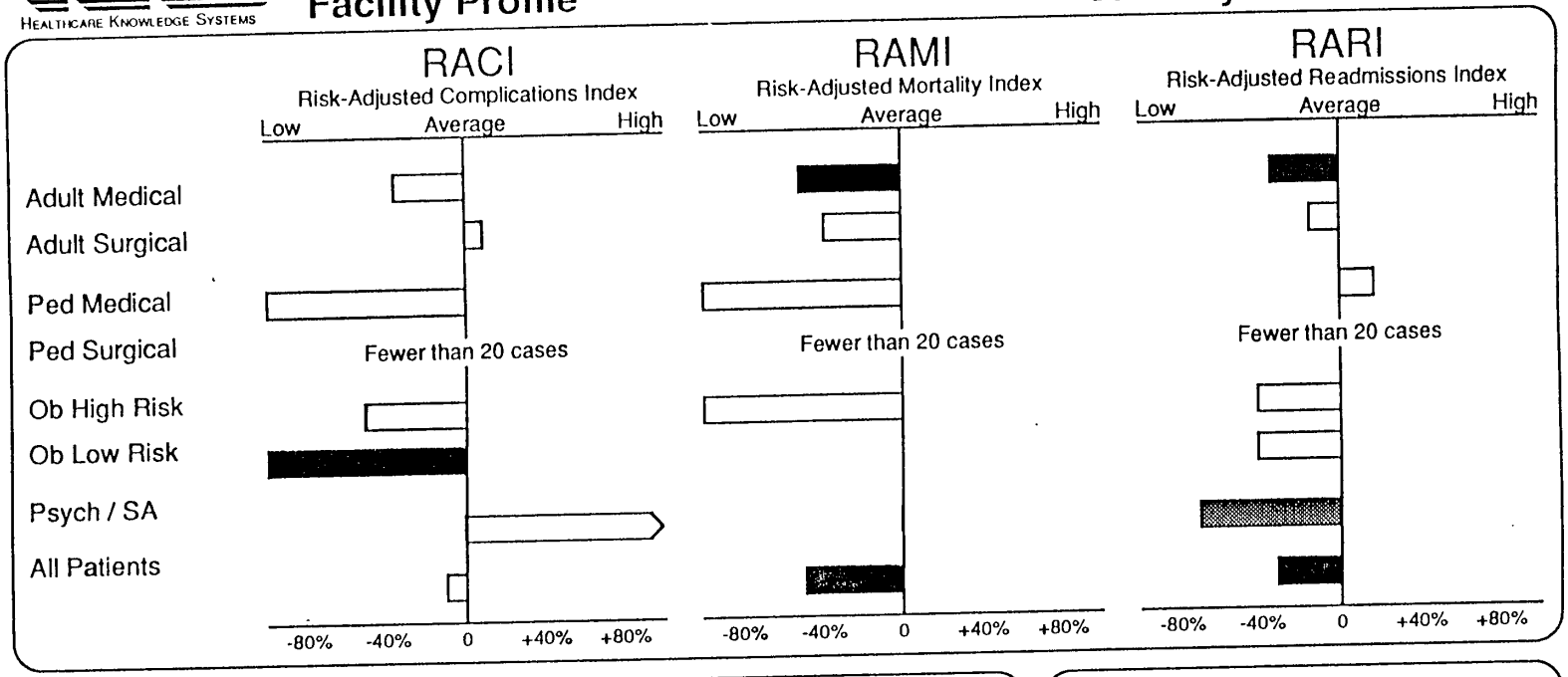
HEALTHCARE KNOWLEDGE SYSTEMS

Quality Assessment Program
Facility Profile

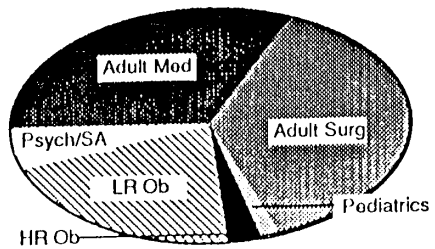
Facility 242
January-December 1989



Data Quality Indicators

	Actual	Standard
Invalid ICD-9-CM codes	40	0
Other coding errors	109	0
Total coding errors	149	0
		CPHA Norm
Errors as % of records	5.8%	0.04%
Diagnoses per discharge	2.3	3.6
Procedures per discharge	0.9	1.9

Service Mix



2,953 Cases (After Exclusions)

Trends

	Jan-Jun 89	Jul-Dec 89	
RACI	0.77	1.03	↑
RAMI	0.29	0.69	↑
RARI	0.72	0.65	↓
Overall	0.65	0.78	↑

Quality Assessment Program • Facility Profile Notes

1. DATA EXCLUSIONS

In order to insure consistency in the analysis of risk-adjusted data, certain problem records plus patients with uncommon risk factors (e.g., AIDS patients, neonates) are excluded from analysis in this report. A record is excluded if it includes any of the following: incalculable age or LOS; LOS = 0, discharged alive; LOS > 365 days; unrecorded or invalid sex or disposition; transfers to another short-stay, general hospital; DRGs 385-391 (neonates), DRG 456 (burns, transferred), DRGs 468-470 and 477; plus any records identifiable as AIDS, stillborn, or ungroupable.

2. CLASSIFICATION OF PATIENTS

A. SERVICE ASSIGNMENT
(Service assignment is made after data exclusions are completed; see Section 2 for a description of exclusions.)

Adult Medical: Patients 18 years or older with no Class 1* procedure, excluding patients grouped into MDC 14 (Obstetrical), MDC 19 (Psych), or MDC 20 (Substance Abuse).
Adult Surgical: Patients 18 years or older with at least one Class 1* procedure, excluding patients grouped into MDC 14 (Obstetrical), MDC 19 (Psych), or MDC 20 (Substance Abuse).
Pediatric Medical: Patients less than 18 years old with no Class 1* procedure, excluding patients grouped into MDC 14 (Obstetrical), MDC 19 (Psych), or MDC 20 (Substance Abuse).
Pediatric Surgical: Patients less than 18 years old with at least one Class 1* procedure, excluding patients grouped into MDC 14 (Obstetrical), MDC 19 (Psych), or MDC 20 (Substance Abuse).
Obstetric High Risk: Patients assigned to MDC 14 (Obstetrical), whose age is < 18 years or > 36 years or who have a coded comorbidity.
Obstetric Low Risk: Patients assigned to MDC 14 (Obstetrical) whose age is from 18 to 36 years and who have no coded comorbidity.
Psychiatric/Substance Abuse: Patients assigned to MDC 19 (Psychiatric) or MDC 20 (Substance Abuse).
All Patients: Total of all patients assigned to a service (after data exclusions) or all patients discharged, as indicated.

B. COMPLICATIONS
ICD-9-CM diagnosis codes, developed by CPHA's clinical consultants, representing many postsurgical and postdelivery complications of care. Only codes which identify complications that occurred during the hospital stay itself are included.

C. COMORBIDITIES
ICD-9-CM diagnosis codes identified by HCFA as complications or comorbidities, excluding those codes which CPHA's clinical consultants defined as complications.

* A Class 1 procedure is an ICD-9-CM procedure that is generally regarded as a "surgical" procedure, involving an operative or anesthetic risk or requiring special personnel, facilities, or equipment. CPHA nosologists maintain an up-to-date list of procedure class.

3. RISK-ADJUSTED OUTCOME MEASURES

A. RISK-ADJUSTED COMPLICATIONS INDEX (RACI)
Ratio of the actual number of discharges with complications to the expected number, taking into account differences in age (under 65, 65-74, 75+), the presence of comorbidities, and the DRG assigned.

B. RISK-ADJUSTED MORTALITY INDEX (RAMI)
Ratio of the actual number of deaths to the expected number. The expected number of deaths is calculated in 2 ways: 1) for cases in low-risk** DRGs, the model takes into account age (under 65, 65-74,75+), the presence of comorbidities, and the DRG assigned; 2) for cases in a high-risk DRG, a logistic regression model is used. In addition to the DRG assigned, the logistic model takes into account the patient's age, risk of death associated with the principal diagnosis, risk of death associated with first operative procedure, whether there were any secondary diagnoses, presence of any cancer except skin cancer as a secondary diagnosis, the risk associated with the comorbidity having the highest risk of death, and the number of secondary diagnoses where the risk of death was greater than the overall risk of the DRG cluster itself.

C. RISK-ADJUSTED READMISSION INDEX (RARI)
Ratio of the actual number of unanticipated readmissions to any hospital (within 14 days of discharge) to the expected number. Readmissions which are ordinarily scheduled (such as bilateral elective surgery or chemotherapy) or unavoidable (e. g., multiple admissions for AIDS patients) are excluded from the analysis.

4. EXPECTED VALUES

Expected values for complications and mortality were derived from a stratified random sample of 400 hospitals (1,764,143 discharges) selected from CPHA's 1988 Length of Stay data base (consisting of 5,485,679 discharges from 1,107 hospitals). The sample was stratified by Census Region and, to the extent possible, by bedside (6-24 beds, 25-49, 50-99, 100-199, 200-299, 300-399, 400-499, 500+ beds).

Expected values for readmissions were derived from a similar stratified sample of 312 hospitals (1,476,861 discharges) with unit numbered medical records. All unit-numbered hospitals from the 400-hospital base used to derive expected complications and mortality were included, along with additional unit-numbered hospitals from the 1988 Length of Stay data base.

** To determine whether a DRG is low-risk or high-risk, CPHA's national comparative data base is used to calculate actual mortality for each DRG cluster (adjacent groups of similar DRGs). DRGs in clusters where the overall mortality rate is < 5% are considered low risk; those in clusters where overall mortality is >= 5% are considered high risk. Of the 329 clusters, 273 are low risk and 56 are high risk.

5. DATA QUALITY INDICATORS

Invalid ICD-9-CM Codes shows the total number of invalid (non-existent) diagnosis and procedure codes submitted on all records
Other Coding Errors is the number of times other coding errors are detected (e.g., principal diagnosis does not match age of newborn, C-section recorded but diagnosis is uncomplicated delivery).
Total Coding Errors is the sum of the preceding two indicators.

The standard for coding errors is zero. Because coding quality is a key factor in outcome measures that use ICD-9-CM codes, any variation from zero errors is considered significant.

Errors as a Percent of Records is Total Coding Errors expressed as a percentage of all records audited.
Diagnoses Per Discharge is the total number of all diagnoses (principal and secondary) divided by the total number of inpatient episodes reported.
Procedures Per Discharge is the total number of all procedures (principal and secondary) divided by the total number of inpatient episodes reported.

The last three measures compare the facility's performance to averages from a larger comparative data base. Unless otherwise indicated in the column heading, CPHA's national data base is used as the basis of the comparison group.

6. REPORTING CONVENTIONS

A. Statistical Significance is indicated in lines of text through the use of boldface type. On the bar graphs, significance is indicated by the shade of the bar: no shading = not significant, shaded = significant at p=.05, solid color = significant at p=.01). Poisson tests were used to test significance where the number of observed adverse events was less than 100. The normal approximation to the binomial distribution was used when the observed number of adverse events was 100 or more.

B. Values for the Risk-Adjusted Indices are not displayed on the bar graphs unless there are at least 20 cases in the relevant group.

C. The risk-adjusted outcome measures are all ratios, and as such have a lower bound of zero and no upper bound. The bar graphs represent these numbers as percentages above and below the standard (in each case, the standard is a ratio of 1.00 - where the number of observed adverse events is equal to the number expected.) An index score more than 100% larger than the standard (which is to say, a ratio greater than 2.00) is represented by a pointed bar.

HKS Quality Assessment Program
Facility Profile Table
January-December 1989

Facility 331

	Total N	N after Exclusions	Risk-Adjusted Complications Index Observed	Expected	Index	Risk-Adjusted Mortality Index Observed	Expected	Index
Adult Medical	729	712	3	6.83	0.44	19	35.90	**0.53++**
Adult Surgical	1511	1465	89	77.56	1.15	24	28.32	0.85
Pediatric Medical	382	325	2	1.82	1.10	3	1.73	1.73
Pediatric Surgical	340	279	8	7.47	1.07	2	3.13	0.64
High Risk Obstetric	165	146	1	3.30	0.30	0	0.05	0.00
Low Risk Obstetric	719	710	3	5.37	0.56	0	0.00	1.00
Psychiatric/Substance Abuse	1	1	0	0.01	0.00	0	0.00	0.00
Facility Total	3847	3638	106	102.35	1.04	48	69.14	**0.69++**

	Risk-Adjusted Readmission Index Observed	Expected	Index	Composite Risk-Adjusted Quality Index Observed	Expected	Index
Adult Medical	22	35.98	**0.61++**	44	78.71	**0.56++**
Adult Surgical	29	45.77	**0.63++**	142	151.65	0.94
Pediatric Medical	6	9.48	0.63	11	13.03	0.84
Pediatric Surgical	7	6.26	1.12	17	16.86	1.01
High Risk Obstetric	5	4.45	1.12	6	7.80	0.77
Low Risk Obstetric	4	3.92	1.02	7	9.29	0.75
Psychiatric/Substance Abuse	0	0.03	0.00	0	0.04	0.00
Facility Total	73	105.89	**0.69++**	227	277.38	**0.82++**

*An entry printed in **bold** type indicates the value printed is statistically significantly different from the expected value (as determined by a Poisson test). Good performance is shown by + (significant at p≤.05) or ++ (significant at p≤.01) and poor performance by - or - - .

HKS Quality Assessment Program
Facility Profile Table
January-December 1989

Facility 231

	Total N	N after Exclusions	Risk-Adjusted Complications Index Observed	Expected	Index	Risk-Adjusted Mortality Index Observed	Expected	Index
Adult Medical	651	635	1	3.90	0.26	4	6.49	0.62
Adult Surgical	203	201	5	4.29	1.17	0	0.47	0.00
Pediatric Medical	20	18	0	0.11	0.00	0	0.01	0.00
Pediatric Surgical	2	2	0	0.10	0.00	0	0.01	0.00
High Risk Obstetric	3	3	0	0.05	0.00	0	0.00	0.00
Low Risk Obstetric	4	3	0	0.05	0.00	0	0.00	1.00
Psychiatric/Substance Abuse	300	297	1	0.21	4.72	2	0.19	10.47
Facility Total	1183	1159	7	8.71	0.80	6	7.18	0.84

	Risk-Adjusted Readmission Index Observed	Expected	Index	Composite Risk-Adjusted Quality Index Observed	Expected	Index
Adult Medical	7	14.95	**0.47+**	12	25.34	**0.47++**
Adult Surgical	2	2.09	0.96	7	6.85	1.02
Pediatric Medical	0	0.62	0.00	0	0.74	0.00
Pediatric Surgical	0	0.07	0.00	0	0.18	0.00
High Risk Obstetric	0	0.02	0.00	0	0.07	0.00
Low Risk Obstetric	0	0.03	0.00	0	0.08	0.00
Psychiatric/Substance Abuse	14	8.79	1.59	17	9.19	1.85
Facility Total	23	26.59	0.87	36	42.48	0.85

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Facility Profile Table

January-December 1989

Facility 153

	Total N	N after Exclusions	Risk-Adjusted Complications Index Observed	Expected	Index	Risk-Adjusted Mortality Index Observed	Expected	Index
Adult Medical	787	779	2	3.45	0.58	7	7.66	0.91
Adult Surgical	291	285	10	8.21	1.22	0	1.08	0.00
Pediatric Medical	52	38	0	0.28	0.00	0	0.09	0.00
Pediatric Surgical	15	15	0	0.29	0.00	0	0.01	0.00
High Risk Obstetric	42	40	0	0.91	0.00	0	0.01	0.00
Low Risk Obstetric	220	217	0	1.07	0.00	0	0.00	1.00
Psychiatric/Substance Abuse	9	8	0	0.03	0.00	0	0.04	0.00
Facility Total	1416	1382	12	14.25	0.84	7	8.88	0.79

	Risk-Adjusted Readmission Index Observed	Expected	Index	Composite Risk-Adjusted Quality Index Observed	Expected	Index
Adult Medical	15	22.62	0.66	24	33.73	0.71
Adult Surgical	3	5.07	0.59	13	14.36	0.91
Pediatric Medical	1	1.40	0.71	1	1.77	0.57
Pediatric Surgical	1	0.25	3.99	1	0.55	1.81
High Risk Obstetric	0	0.51	0.00	0	1.43	0.00
Low Risk Obstetric	1	0.65	1.54	1	1.72	0.58
Psychiatric/Substance Abuse	0	0.29	0.00	0	0.36	0.00
Facility Total	21	30.80	**0.68+**	40	53.93	**0.74+**

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HKS Quality Assessment Program

Facility Profile Table

January-December 1989

Facility 242

	Total N	N after Exclusions	Risk-Adjusted Complications Index Observed	Expected	Index	Risk-Adjusted Mortality Index Observed	Expected	Index
Adult Medical	1005	964	5	7.79	0.64	14	28.76	**0.49++**
Adult Surgical	1001	963	44	40.45	1.09	5	8.24	0.61
Pediatric Medical	69	46	0	0.26	0.00	0	0.10	0.00
Pediatric Surgical	19	17	0	0.37	0.00	0	0.00	0.00
High Risk Obstetric	218	209	1	2.03	0.49	0	0.03	0.00
Low Risk Obstetric	699	683	0	5.55	**0.00++**	0	0.00	1.00
Psychiatric/Substance Abuse	72	71	1	0.08	12.30	0	0.04	0.00
Facility Total	3083	2953	51	56.53	0.90	19	37.18	**0.51++**

	Risk-Adjusted Readmission Index Observed	Expected	Index	Composite Risk-Adjusted Quality Index Observed	Expected	Index
Adult Medical	29	44.79	**0.65++**	48	81.34	**0.59++**
Adult Surgical	18	21.06	0.85	67	69.75	0.96
Pediatric Medical	2	1.68	1.19	2	2.03	0.98
Pediatric Surgical	0	0.31	0.00	0	0.68	0.00
High Risk Obstetric	2	3.40	0.59	3	5.46	**0.55+**
Low Risk Obstetric	2	3.31	0.60	2	8.86	**0.23++**
Psychiatric/Substance Abuse	1	3.30	0.30	2	3.42	0.58
Facility Total	54	77.85	**0.69++**	124	171.55	**0.72++**

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HKS Quality Assessment Program
Facility Profile Table
January-December 1989

4 Facilities Total

	Total N	N after Exclusions	Risk-Adjusted Complications Index Observed	Expected	Index	Risk-Adjusted Mortality Index Observed	Expected	Index
Adult Medical	3172	3090	11	21.97	**0.50++**	44	78.82	**0.56++**
Adult Surgical	3006	2914	148	130.50	1.13	29	38.12	0.76
Pediatric Medical	523	427	2	2.47	0.81	3	1.93	1.56
Pediatric Surgical	376	313	8	8.23	0.97	2	3.15	0.63
High Risk Obstetric	428	398	2	6.29	0.32	0	0.10	0.00
Low Risk Obstetric	1642	1613	3	12.04	**0.25++**	0	0.00	1.00
Psychiatric/Substance Abuse	382	377	2	0.33	5.98	2	0.27	7.43
Facility Total	9529	9132	176	181.83	0.97	80	122.38	**0.65++**

	Risk-Adjusted Readmission Index Observed	Expected	Index	Composite Risk-Adjusted Quality Index Observed	Expected	Index
Adult Medical	73	118.34	**0.62++**	128	219.13	**0.58++**
Adult Surgical	52	74.00	**0.70++**	229	242.62	0.94
Pediatric Medical	9	13.18	0.68	14	17.58	0.80
Pediatric Surgical	8	6.89	1.16	18	18.27	0.99
High Risk Obstetric	7	8.39	0.83	9	14.78	0.61
Low Risk Obstetric	7	7.91	0.89	10	19.95	**0.5+**
Psychiatric/Substance Abuse	15	12.42	1.21	19	13.02	1.46
Facility Total	171	241.12	**0.71++**	427	545.33	**0.78++**

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HKS Quality Assessment Program

Facility Profile Table

January-December 1989

23 Hospitals Compared

Facility Number	Total N	N after Exclusions	Risk-Adjusted Complications Index Observed	Expected	Index	Risk-Adjusted Mortality Index Observed	Expected	Index
294	1122	932	9	15.00	0.60	13	17.98	0.72
223	798	706	6	14.69	**0.41++**	10	10.71	0.93
222	939	914	12	9.79	1.23	4	8.86	0.45
262	658	626	3	7.65	0.39	2	3.55	0.56
235	1215	1015	8	17.47	**0.46++**	4	12.89	**0.31++**
242	3083	2953	51	56.53	0.90	19	37.18	**0.51++**
153	1416	1382	12	14.25	0.84	7	8.88	0.79
234	1136	1091	17	22.19	0.77	27	36.33	0.74

Facility Number	Risk-Adjusted Readmission Index Observed	Expected	Index	Composite Risk-Adjusted Quality Index Observed	Expected	Index
294	18	37.15	**0.48++**	40	70.14	**0.57++**
223	16	27.07	**0.59+**	32	52.48	**0.61++**
222	17	32.78	**0.52++**	33	51.43	**0.64++**
262	16	19.56	0.82	21	30.75	**0.68+**
235	34	35.89	0.95	46	66.25	**0.69++**
242	54	77.85	**0.69++**	124	171.55	**0.72++**
153	21	30.80	**0.68+**	40	53.80	**0.74+**
234	36	49.03	**0.73+**	80	107.55	**0.74++**

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HKS Quality Assessment Program
Facility Profile Table
January-December 1989

23 Hospitals Compared

Facility Number	Total N	N after Exclusions	Risk-Adjusted Complications Index Observed	Expected	Index	Risk-Adjusted Mortality Index Observed	Expected	Index
190	269	252	5	3.89	1.29	4	4.42	0.90
189	386	362	9	7.24	1.24	11	13.63	0.81
283	3689	3006	43	70.38	**0.61++**	48	57.00	0.84
331	3847	3638	106	102.35	1.04	48	69.14	**0.69++**
231	1183	1159	7	8.71	0.80	6	7.18	0.84
282	1531	1120	13	17.72	0.73	7	14.42	**0.49+**
227	3377	2851	51	61.69	0.83	25	40.92	**0.61++**
356	7446	5934	73	126.88	**0.58++**	105	88.17	**1.19 -**

Facility Number	Risk-Adjusted Readmission Index Observed	Expected	Index	Composite Risk-Adjusted Quality Index Observed	Expected	Index
190	6	11.52	0.52	15	19.83	0.76
189	10	16.78	0.60	30	37.65	0.80
283	97	103.96	0.93	188	231.34	**0.81++**
331	73	105.89	**0.69++**	227	277.38	**0.82++**
224	23	26.59	0.87	36	42.47	0.85
282	38	35.43	1.07	58	67.57	0.86
227	98	97.18	1.01	174	199.80	**0.87+**
356	174	188.49	0.92	352	403.54	**0.87++**

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HKS Quality Assessment Program

Facility Profile Table

January-December 1989

23 Hospitals Compared

Facility Number	Total N	N after Exclusions	Risk-Adjusted Complications Index Observed	Expected	Index	Risk-Adjusted Mortality Index Observed	Expected	Index
158	3144	2930	51	61.19	0.83	52	61.27	0.85
179	5505	5372	143	192.48	**0.74++**	206	204.83	1.01
270	4097	3342	109	76.16	**1.43 - -**	43	59.06	**0.73+**
192	3142	2520	66	51.06	1.29	15	18.23	0.82
348	3796	3033	174	91.69	**1.90 - -**	74	89.30	0.83
177	12872	11353	637	409.34	**1.56 - -**	199	304.31	**0.65++**
346	4994	3598	148	93.45	**1.58 - -**	22	30.91	0.71

Facility Number	Risk-Adjusted Readmission Index Observed	Expected	Index	Composite Risk-Adjusted Quality Index Observed	Expected	Index
158	108	108.08	1.00	211	230.54	0.92
179	359	275.38	**1.30 - -**	708	672.68	1.05
270	125	122.90	1.02	277	258.12	1.07
192	81	73.61	1.10	162	142.90	1.13
348	96	115.51	**0.83+**	344	296.50	**1.16 - -**
177	621	482.98	**1.29 - -**	1457	1196.63	**1.22 - -**
346	151	105.74	**1.43 - -**	321	230.10	**1.40 - -**

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MEDICAL CARE
December 1990, Vol. 28, No. 12

Measuring Hospital Performance

The Development and Validation of Risk-Adjusted Indexes of Mortality, Readmissions, and Complications

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In this study we used information from discharge abstracts to develop three different risk-adjusted measures of hospital performance: a Risk-Adjusted Mortality Index, a Risk-Adjusted Readmissions Index, and a Risk-Adjusted Complications Index. The adjustments have face validity, and appear to account for much of the variation across hospitals in the rates of these adverse events. The indexes are stable over time, and are not biased with respect to hospital size, ownership, or teaching status. All three indexes appear to have construct validity when tested against the changes in hospital care that occurred when PPS was introduced. Key words: hospital quality; mortality; readmissions; complications. (Med Care 1990; 28:000–000)

The quality of care rendered by hospitals has received increased attention over the past several years, in part because the Health Care Financing Administration (HCFA) has been releasing information to the public on hospital mortality rates.[1] Even though the HCFA releases received much criticism, the publicity which accompanied these releases has stimulated discussion on how the quality of hospital care should be measured.[2,3] Purchasers of care (individuals, employers, and third-party payors) want valid, yet inexpensive measures of quality as they attempt to compare the performance of various hospitals. Quality, however, is not easily defined and measured. The Office of Technology Assessment (OTA) has recently defined the quality of medical care as "the degree to which the process of care increases the probability of outcomes desired by patients, and reduces the probability of undesired outcomes, given the state of medical knowledge."[3] Ideally, we would like to be able to compare rates of both positive and negative outcomes across hospitals. This, however, is difficult to do.

Although differences in patient outcomes

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This research was done at the Commission on Professional and Hospital Activities, under HCFA contract no. 18C98841/5-01. The statements contained in this report are solely those of the authors, and do not reflect the views or policies of the Health Care Financing Administration.

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across hospitals can be viewed as a result of hospital performance, there are several other factors that also influence outcomes. Differences may be due to variations in the types of patients treated; the severity of the patients' principal diagnoses; the type and complexity of the patients' co-morbidities; or the social and financial condition of the patients. In order to measure provider performance with accuracy, one must control for these factors. It is clearly not possible to do so completely, given our existing data sets and measurement tools. It is, however, possible to use existing data to approximate some of these control variables.

In this study we used information contained on existing databases to develop proxies for many of the factors other than provider performance which are related to health outcomes. By means of indirect standardization to the Commission on Professional and Hospital Activities' (CPHA's) national all-payor database, we obtained empirical information to calculate risk factors, using a data set of six million discharge abstracts.

We developed three different risk-adjusted measures of hospital performance: 1) the Risk-Adjusted Mortality Index (RAMI), 2) the Risk-Adjusted Readmissions Index (RARI), and 3) the Risk-Adjusted Complications Index (RACI).

These indexes take into account the differences in reasons for admission and differences in physiological reserve among the patients treated in different hospitals, and estimate differences in hospital performance as the residual. Even though some risk factors are only approximated by this method, the approach appears to be useful. The models are practical, insofar as they use existing databases, and they are comprehensive, insofar as they measure hospital performance for all payors and virtually all types of cases treated in a given hospital. The question which is addressed in this paper is whether these three risk-adjusted measures constitute a valid approach to using existing databases to assess hospital performance.

In order to establish the validity of these three risk-adjusted indexes, it is necessary to consider several different questions:

1. Do these indexes have face validity?
2. Do these indexes have predictive validity?
3. Are these indexes stable over time?
4. Are these indexes biased with respect to hospital characteristics?
5. Do these indexes have construct validity?

The purpose of this paper is first to describe the construction of these three risk-adjusted indexes of hospital performance, and then to provide an assessment of their validity. If these indexes appear to be valid, then they may provide an inexpensive and practical method of measuring hospital performance using data sets which are readily available.

Background

Although it would be preferable to rate the quality of hospital care directly, by measuring the changes in patients' health status following treatment, there is no practical way to obtain data on patient health status before and after treatment for a large national sample of hospitals. Instead, we measured variations in rates of adverse consequences across hospitals, under the assumption that the hospitals with the lower rates of adverse events are producing better patient outcomes. Thus, our measures of adverse outcomes are used as proxies for positive measures of outcomes.

There are many historical precedents for measuring rates of adverse events, rather than using direct or "positive" measures of quality. Death has been used as an indicator by many investigators, including Wennberg,[4] Flood,[5] Luft,[6] Knaus,[7] Kelly,[8] and Hebel.[9] Readmissions have been examined by Fethke,[10] Anderson,[11] Gooding,[12] Riley,[13] Zook,[14] Holloway,[15] Smith,[16] and Roos,[17]

among others. Complication rates have been studied by Roos,[17] Brook,[18] Chilton,[19] Adams,[20] and others. In most of these studies, however, the investigators focused on specific procedures, disease categories, or hospital units; the investigators did not attempt to construct multiple risk-adjusted measures of overall hospital performance.

In order to construct such indexes of hospital performance, two separate but related problems need to be solved: It is essential to take into account differences across hospitals in the types of patients treated (case-mix); and it is necessary to use an appropriate severity measure to take into account differences across hospitals in the severity of illness within each of the disease categories (case complexity). Unless these adjustments are made, one cannot make valid comparisons across hospitals, since those hospitals treating more "difficult" cases will appear to have worse outcomes. In an article summarizing many of the methodologic issues in the risk adjustment of outcome data, Blumberg[21] described indirect standardization, the principal technique used for risk adjustment of outcome data. Many researchers have used this approach to account for differences in the case-mix and complexity of patients treated in different hospitals, including Moses[22]; Flood[5]; Luft[6]; Knaus[7]; and Kelly.[8] In a recent article, we described in detail the use of indirect standardization to construct the Risk-Adjusted Mortality Index (RAMI), one of the measures of hospital performance reported in this paper.[23]

In order to perform indirect standardization, one must choose appropriate disease classification and severity measures for categorizing patients. The purpose of the categorization is to classify patients into relatively homogeneous groupings with respect to their risk of the outcome predicted in the model. We used the Diagnosis Related Group (DRG) classification system to classify patients according to their diagnoses, since this system is generally understood, and is based on the reason for admission to the hospital. Also, the DRG classification system has had extensive review by clinicians. The next step was to select a severity system that would reflect differences in patient risk within the DRGs. Several severity measures were available, but were not considered to be good choices for our purposes. We limited our choice to those severity measures that utilize data that are present in billing or abstracting systems. We also wanted a system that is based on the condition of the patients at the time they entered the hospital. Moreover, if a severity measure was constructed to predict a variable such as resource use or length of stay, rather than the patient outcome of interest, then we did not consider the system to be useful for our purposes. For example, when developing the risk-adjusted readmissions index, our objective was to use a severity measure which actually takes into account risk factors that are predictive of readmissions, rather than risk factors that are predictive of some other measure, such as length of stay. As Sullivan points out, "There is little empirical justification for the assumption that a unidimensional continuum underlies and relates the measures referred to as healthy and unhealthy in different contexts. Health, defined without reference to a specific situation or purpose of measurement, may be merely a verbal artifact."[24]

We could not use several of the existing severity classification systems, since they require data on various physiologic measures, and these data are not available in billing or abstract datasets. Thus, severity measures such as APACHE,[25] Medis-Groups,[26] or the Patient Severity Index[27] were not practical. Also, we did not use Patient Management categories,[28] since this measure groups patients according to the amount of resources used, rather than the risk of various outcomes.

While Staging[29] is based on existing datasets, and does predict adverse events, nevertheless we rejected Staging as a severity

measure because iatrogenic events (complications) are included in the calculation of the severity scores. Thus, if a patient's condition worsened due to an iatrogenic event, the patient may be assigned a higher stage. Since we wished to know the patient's condition (risk) at the time the patient entered the hospital, staging was not judged to be an appropriate approach. Moreover, in staging each co-morbidity is usually "staged" separately, and it is therefore difficult to estimate the interactions of principal and secondary diagnoses when modeling the risks of adverse outcomes. It is likely that the interaction of certain principal and secondary diagnoses produces risks that are greater than the risks of either diagnosis taken separately.

Instead of using any of these existing severity measures, we chose to use an empirical approach, in which we modeled the risk of each outcome within each diagnostic category by using variables that are found in billing and abstract data, such as principal and secondary diagnoses, age, and surgical procedures. This approach allowed us to use the existing datasets to the full extent possible, while ensuring that the risk factors used in each model are the appropriate classification schemes for that particular outcome.

Methods

Three different risk-adjusted indexes of hospital performance were developed: 1) the Risk-Adjusted Mortality Index (RAMI), 2) the Risk-Adjusted Readmission Index (RARI), and 3) the Risk-Adjusted Complications Index (RACI).

The risk factors for each of these quality measures were modeled using a national CPHA data file, containing six million cases from 1983, from 776 short-term US general hospitals. These CPHA hospitals had the following characteristics, when compared to all US nonfederal short-term general hospitals (see Table 1).

This cohort of 776 CPHA hospitals was generally representative of the 5,663 US hospitals in the universe. However, the for-profit hospitals and Southern hospitals are somewhat underrepresented, while major teaching hospitals are overrepresented. Nevertheless, it is important to realize that

TABLE 1. Characteristics of CPHA Hospitals Used for Modeling Patient Risk Factors*

Hospital Characteristics	Number of CPHA Hospitals	Number of All US Hospitals	CPHA Hospitals as % of All US Hospitals
Region			
NE	103	813	13
NC	277	1674	17
S	219	2125	10
W	177	1051	17
Teaching Status			
Nonteaching	620	4795	13
Minor teaching	106	742	14
Major teaching	50	126	40
Ownership			
Government	184	1686	11
Not-for-profit	531	3220	16
For profit	61	757	8
Bedsize			
<100	293	2771	11
100–199	186	1209	15
200–500	244	1369	18
500+	53	314	17
Total	776	5663	14

* Source is the American Hospital Association Annual Survey of Hospitals for 1983.

the discharges are the units of analysis for modeling the risk of each outcome. There is reason to believe that these six million discharges used for modeling risk factors are representative of all discharges treated in the U.S.

The following cases were excluded from the analysis file:

1. All cases transferred to other short-term hospitals (referral centers, specialty hospitals).

2. All cases of newborn infants. Since most critically ill newborns are transferred to neonatal centers, it was not possible to model risk factors for this group in a valid manner. Moreover, newborn weight, a critical variable in predicting infant deaths, was not available.

3. All cases with stays of less than one day who were discharged alive (presumed to be outpatient surgery and other outpatient cases).

We then used an empirical approach to model the risk of death, readmission, and complications associated with each reason for admission. Since it was apparent that the patient characteristics associated with the risk of each outcome would vary from one disease to another, separate models were developed for each disease category. The first step in constructing each measure was the aggregation of Diagnosis Related Groups (DRGs) into clusters which group those DRGs with the same clinical condition. This clustering was necessary for our purposes because some of the factors associated with an increased risk of death, readmission, or complication within a clinical condition were used as the basis for DRG divisions (age, co-morbidities/complications). For instance, DRGs 89, 90, and 91 are all simple pneumonia and pleurisy, but the DRGs differ by the age of the patient. We needed to regroup the DRGs into clusters, to determine how age, co-morbidities, and other factors were associated with an increased risk of adverse outcomes within each disease condition. This clustering procedure resulted in 316 categories, each representing a different clinical condition. Once this clustering was done, we proceeded to develop the three different indexes: RAMI, RARI, and RACI.

The risk models were based on clinical factors which were recorded in the CPHA dataset. CPHA abstracts contain, among other items, the following data elements for each patient discharge: age, race, hospital identification, dates of admission and discharge, discharge status (alive, dead), principal diagnosis, secondary diagnoses (up to 11), and principal surgical procedure.

A description of the construction of each of the three indexes follows.

The Risk-Adjusted Mortality Index (RAMI)

Two different types of models were employed when modeling the risk of mortality for each patient. This was done so that the most appropriate technique would be used for each disease or condition. These models are:

1. The Contingency Table Model: For each of the 252 DRG clusters where the death rate was less than 5% (83% of all discharges; 28% of all deaths), a Contingency Table Model was developed, since the estimating procedures for logistic regressions are inadequate in this situation.

2. The Logistic Model: For each of the 64 clusters where the death rate was 5% or more (17% of all discharges; 72% of all deaths), a logistic model was developed.

The Contingency Table Model is based on deriving a separate 2 × 3 table for each of the DRG clusters with relatively low death rates. The age of patients (0–64; 65–74; 75+) and the presence of co-morbidities were used as classifying variables, since these were the best predictors of death in the more complicated models that we tried to construct. The death rate was determined empirically within each of the six cells.

Complications were excluded as risk factors, because we wanted to measure the severity of a patient's illness at the time of admission, in order to assess the risk of the

patient's primary medical problem and related comorbidities prior to medical care intervention. However, the HCFA list of comorbidities and complications (CCs) contains both co-morbidities (secondary diagnoses present at the time of admissions) and complications (conditions that arose during the course of treatment). Because we wanted to measure co-morbidities, but not complications, we attempted to separate the two. Our medical consultant designated 70 of the conditions on the HCFA CC list as most likely to be complications of surgery, or iatrogenic events (see Appendix). This list includes problems such as transfusion reactions, accidental operation lacerations, etc. This was a conservative approach, insofar as certain conditions such as pneumonia and urinary tract infections, which may or may not be complications, were assumed to be co-morbidities. Because the structure of the ICD-9-CM codes explicitly identifies surgical and OB/GYN complications, but not medical complications, we were unable to distinguish whether some medical problems arose during treatment. Therefore, hospitals were credited for having sicker patients if we could not be sure whether a condition was present at the time of admission. However, obvious complications were removed as "risk factors" in the models, since hospitals should not be credited for a more complex case mix on the basis of a high frequency of iatrogenic events among their patients.

Thus, the Contingency Table Model was used to distinguish six risk categories, within each of the relatively low death rate clusters, based on three age groups and the presence of comorbidities. These six risk categories do show significant differences in death rates across the six cells. Table 2 is an example of such a 2 × 3 contingency table.

Logistic Models were used to assess the relative effects of various clinical factors on the probability of death. These models were constructed for each of the 64 DRG clusters which had relatively high death rates (5% or more). Thus, we controlled for the patient's immediate problem or illness by modeling each DRG cluster separately. In our Logistic Models the dependent variable is discharge status (alive or dead). The independent variables in the logistic regressions are proxies for the patient's condition at the time of admission to the hospital.

TABLE 2. Death Rates for Viral Meningitis, by Age and Co-morbidities

Age	Any Co-morbidities?*	
	No	Yes
Under 65	0.008	0.078
65–74	0.046	0.174
75+	0.060	0.244

* Complications are not considered here.

The construction of the independent variables for the Logistic Models was a two-step process:

1. Preliminary assessments were performed to estimate (empirically) the relative risk of each surgical procedure and each secondary diagnosis within each of the Major Diagnostic Categories (MDC). This preliminary assessment allowed us to assign a risk score to each procedure and each secondary diagnosis within each MDC. This approach was necessary because the risk associated with a given secondary diagnosis varied across the different MDCs.

2. The risk factors associated with each procedure and with each secondary diagnosis were then placed into a series of tables, which could be used to look up the risks associated with there variables for each patient record.

The next step was to develop the Logistic Models. Within each of the 64 clusters the following independent variables were included as proxies for the patient's condition when admitted to the hospital: patient's age; patient's race; risk of death associated with the principal diagnosis, if more than one principal diagnosis is possible within the DRG; risk of death associated with first operative procedure (surgical patients only); whether there were any secondary diag-

nosis; presence of any cancer except skin cancer as a secondary diagnoses; risk associated with the comorbidity having the highest risk of death (excluding complications); and number of secondary diagnoses (except complications) where the risk of death was greater for the secondary diagnosis than the overall risk associated with the DRG cluster itself.

It should be noted that we could not model certain aspects of the patient's physiological reserve (nutritional status, smoking history), since we lacked the necessary data. Also, we could not model the patient's social condition (financial status, family support) because the data were not available.

The overall risk of death for each patient is thus derived from the combination of the risks associated with the patient's primary diagnosis, principal procedure, age, and certain secondary diagnoses. Using either the Contingency Table Models or the Logistic Models, as appropriate, we were able to calculate the probability of death for any given patient. By processing patient records through the models and accumulating the probabilities of death for groups of cases, we can thus aggregate patients, and then predict the number of deaths that would have occurred had this group of patients been given "average" care (standardized to the six million observations we used to derive risks).

Risk-Adjusted Readmissions Index (RARI)

The Risk-Adjusted Readmissions Index (RARI) was developed in a manner parallel to the Contingency Table approach used in the Risk-Adjusted Mortality Index (RAMI). For RARI, however, the dependent variable is whether an unanticipated readmission to the same hospital occurred within 30 days of discharge. Clearly many readmissions are scheduled, and thus do not represent poor hospital performance. Since we were interested in using the RARI as a measure of adverse outcomes, we excluded those types of readmissions which would ordinarily be either scheduled (bilateral elective surgery; chemotherapy; diagnostic admission followed by surgical admission) or unavoidable (multiple admissions for AIDS patients, cancer patients, etc.). Our clinical consultant compiled a list of such exclusions, which can be obtained from the authors, by request. In addition, cases that were transferred to another short-term hospital, cases that died during the first admission, and newborns were excluded from the RARI.

After cases were grouped into DRG clusters, 2 × 3 Contingency Tables were constructed for each DRG cluster, based on the age of the patients and whether comorbidities or complications occurred during the original stay. (Note that in RARI we included complications as risk factors for readmissions.) We then calculated the probability of readmission for each cell of each DRG cluster model. This was done empirically, using indirect standardization from the large 1983 CPHA database. It should be noted that not all of the hospitals in the six million database used unit record numbering, which was necessary to link episodes of hospitalization. Therefore, a somewhat smaller subset of hospitals was used to model readmissions.

Once the 2 × 3 tables were calculated for each DRG cluster, we used the tables to estimate the number of readmissions that would normally occur for any hospital, given its case mix and case complexity, i.e., the distribution of patients across DRG clusters, and age/CC distribution within each DRG cluster.

The Risk-Adjusted Complications Index (RACI)

The Risk-Adjusted Complications Index (RACI) was constructed in a manner similar to the RARI, described in the previous section. Once again 2 × 3 Contingency Tables were used within each cluster, but this time the dependent variable was whether or not

a complication occurred during the hospital stay. The independent variables were age and the presence or absence of comorbidities. (Note that the presence or absence of complications was *not* used as an independent variable for RAMI or RACI, but was for RARI.) The list of complications we considered was developed by our clinical consultant to represent many postsurgical and postdelivery complications. (See Appendix to this report.) We excluded newborns, all cases which died, and all cases that were transferred to another short-term hospital. Thus, the RACI represents an effort to look at complications that occurred during the hospital stay, but that did not result in death.

Validation

Once the three models were developed, the next step was to address the issues of validity. To what extent do these three indexes actually represent differences in the quality of inpatient care delivered in hospitals? Several different aspects of validity are evaluated in this section:

1. Do these indexes have face validity?
2. Do these indexes have predictive validity?
3. Are these indexes stable over time?
4. Are these indexes biased with respect to hospital characteristics?
5. Do these indexes have construct validity?

Face Validity of the Models

In order for the measures to have face validity, they must be derived from risk factors which are known to be related to the outcomes of interest. It seemed reasonable from a clinical standpoint to use the following factors to define risk categories for each outcome, since these factors should affect a patient's risk of experiencing each of the adverse outcomes we were modeling: 1) principal reason for admission, 2) age, and 3) co-morbidities.

Our first concern was to see if these factors really were predictive of each of the outcomes we were modeling. The principal reason for admission, as represented by the DRG clusters, did differentiate patients according to the risk of the adverse outcomes of interest. As mentioned earlier, the clustering of DRGs produced 64 high-risk clusters (death rate over 5%) and 271 low-risk clusters in the RAMI model. Thus, the DRG clusters did sort patients into categories that are relatively homogeneous in terms of risk of death. The DRG clusters were also effective in differentiating patients into relatively homogeneous categories for predicting rates of readmissions and complications.

When we looked at further breakdowns, by age and co-morbidities, within each DRG cluster, we found considerable variation in outcomes from cell to cell (see Table 2). This type of pattern was consistent across virtually all of the clusters. This was reassuring, since these results confirmed that age and comorbidities did distinguish subgroups of patients with very different rates of adverse outcomes. Our findings were similar for all three measures: there were marked differences in rates of adverse outcomes across the clusters, and considerable differences in rates of outcomes across the six cells within each cluster.

We then generated risk scores for randomly selected records with various combinations of principal diagnoses, ages, and secondary diagnoses, and procedures. Our clinical consultant evaluated whether the risk scores generated appeared reasonable for these records. He was satisfied that the risk scores appeared to be consistent with his clinical experience. We also presented the approach to a panel of medical directors from a large multihospital system. These physicians agreed that the methods had face validity, and that the risk factors used were clinically meaningful.

Predictive Validity of the Models

The next consideration is whether the factors in the models are highly predictive of the appropriate outcomes. How well do

the models work in explaining differences across hospitals in these three outcomes? We expected a much closer fit between actual and predicted rates of outcomes using these models, when compared to using "raw" or unadjusted rates for each hospital. We also expected to find a reasonably good fit between the predicted and actual rates for each outcome across a broad range of hospitals, if these risk adjustments did in fact account for a considerable proportion of the variation in the rates of adverse outcomes across hospitals.

We tested these expectations by randomly selecting a cohort of 300 CPHA short-term US hospitals that are nationally representative of all US short-term hospitals in terms of their size, teaching status, and region. We then used the three models, RAMI, RARI, and RACI, to estimate the predicted rates of each of the three outcomes for all patients discharged from these 300 hospitals in 1983 and 1984, given the patients treated in these hospitals. By processing the patients' records through the models, we accumulated the risk-adjusted probabilities of deaths, readmissions, and complications for each of these hospitals, and compared them to actual rates of each adverse event in each hospital.

Table 3 provides information on the goodness of fit for the three models. The table shows high correlations between predicted and actual outcomes (r^2 = 0.71 in 1983; 0.66 in 1984). The RARI and RACI models have reasonably good fits, but not quite as good as the RAMI. This is as we expected for RARI, because the information on a hospital discharge abstract does not tell us much about a patient's capacity for self-care, compliance with instructions once discharged, or home environment. These factors would seem to be important in influencing the probability of a readmission. The r^2 for RACI of 0.45 in 1983 and 0.53 in 1984 are not too surprising either, since the patient characteristics associated with increased risk of complications are not clearly understood, nor are they well defined in the literature.

TABLE 3. Evaluation of Goodness of Fit and Stability Over Time for Each Measure: 1983–1984[a]

	Correlations (r^2) Between Predicted and Actual Rates of Adverse Events
RAMI	
1983	0.71
1984	0.66
RARI	
1983	0.42
1984	0.48
RACI	
1983	0.45
1984	0.53

[a] Source: Nationally representative samples of 300 CPHA hospitals for 1983 and 1984. Of these, 245 had readmission data.

Next, we performed an analysis to evaluate the extent to which the three adjustment models improved the fit between actual and predicted events, compared to predictions based on "raw" rates of adverse events. First we calculated the average error per cluster per hospital over the 300 hospitals in our sample cohort. The average error per cluster is defined as the average difference between the number of adverse events predicted for each cluster in each hospital, and the number of adverse events actually observed. We then estimated the reduction in the average error per cluster per hospital, using predictions derived from RAMI, RARI, and RACI. The average error per cluster per hospital was reduced from 1.08 cases using "raw" (or unadjusted) mortality rates to 0.38 cases using the risk-adjusted mortality model. For RARI, the average error per cluster per hospital was reduced from 2.23 cases to 1.38 cases. For RACI, the average error per cluster per hospital dropped from 1.06 to 0.68 cases. Thus, the adjustment methodology gives a much better fit for all three measures, and is therefore useful when attempting to control for differences in patient risk factors when com-

paring rates of adverse outcomes across different hospitals.

Stability Over Time

Table 3, which shows the results on goodness of fit for the sample cohort of hospitals for both 1983 and 1984, also demonstrates that the correlations between the predicted and actual rates for each adverse event are stable from 1983 to 1984. This confirms that the same risk factors were predictive of adverse outcomes in both years, even though the Medicare Prospective Payment System was put into place between 1983 and 1984.

Bias of the Models

Bias in the models was evaluated by using information on hospital characteristics and region, which were not part of the risk-adjustment methodology, in three separate multiple regressions, with the RAMI, RARI, and RACI scores for the 300 hospitals in the sample cohort as the dependent variables.

The results showed no significant association between a hospital's RAMI score and its teaching status, region, hospital case-mix index, ownership, range of services offered, average cost per case, its urban or rural location, its percentage of Medicare cases, or its percentage of Medicaid cases. The only variables that were associated with the RAMI scores were the total number of beds ($P = 0.04$, but practically insignificant, with a value of 0.0005) and waivered status, which had a positive association with a higher RAMI score. One possible reason that hospitals in waivered states looked better is that these hospitals had been operating under various types of prospective payment systems for several years. Perhaps these hospitals already had learned to code diagnoses more completely on their abstract and billing records, since such information influenced their income. Hospitals that coded secondary diagnoses more completely would appear to have a higher-risk group of patients, compared to other hospitals that had similar patients, but did not code information as completely. Thus, the hospitals in the waivered states may have learned to "upcode" by 1983, whereas most other hospitals learned to code more completely after 1983.

A multiple regression analysis also was used to test for bias of RARI, using hospital characteristics as the independent variables. The results showed that RARI is not biased by region, type of hospital ownership, or teaching status of the hospital. The only hospital characteristics that were associated with the RACI scores were the range of services ($P = 0.02$, with a value of -0.0004) and rural status ($P = 0.00$, with a value of -0.0083).

Results of a multiple regression analysis for RARI showed that the index is unbiased with respect to hospital ownership, bedsize, and teaching status. There were, however, statistically significant associations between the RACI scores and region (values ranging from 0.0059 to 0.0071); case-mix index (value of -0.0162); and the range of services (value of 0.0003).

Construct Validity

This last question concerns the issue of construct validity. Construct validity requires that the measures respond in the expected ways to changes in the health care system. Such changes can only be tested retrospectively. The implementation of the Medicare Prospective Payment System in 1983 provided an excellent opportunity to assess the construct validity of these indicators.

Given the financial incentives of the Medicare Prospective Payment System, and given the findings of early studies of the changes that took place when PPS was introduced, it was possible to predict how the three risk-adjusted indexes should respond to PPS. By examining the changes in these three indexes from 1983 to 1984, we were

able to test whether each of the indexes changed in the expected direction. If the responses were consistent with our expectations, then that finding provides support for the claim that the measures have construct validity.

When the Medicare PPS was introduced in 1983, many changes occurred in the health care delivery system. In an earlier study, we described rather dramatic changes that occurred between 1983 and 1984 in Medicare admission rates, changes in patient case mix, average length of stay, and discharge locations.[30]

Many of these changes were expected, given the financial incentives of PPS. The average length of stay decreased significantly for Medicare patients, with a greater proportion of patients discharged to home health care and other locations to complete their recovery. Also, between 1983 and 1984 there was a significant decrease in the number of Medicare patients treated in inpatient hospital settings, accompanied by shifts to outpatient treatment settings. This resulted in a higher case-mix for the hospital inpatient units, since many of the less complex cases were no longer admitted to these inpatient units, but treated in outpatient settings.

There is also reason to believe that the coding of abstract and billing information changed substantially between 1983 and 1984. Under the Medicare PPS, the payment for certain types of patients increases if either the principal diagnosis differs slightly, or if various secondary diagnoses, which were designated by the Health Care Financing Administration as comorbidities or complications, are present. Thus, there were financial incentives to code more completely and precisely, or to "upcode," depending on one's perspective.

We found in an earlier study that the proportion of Medicare cases having at least one secondary diagnosis that was a comorbidity or complication rose from 53% in 1983 to 60% in 1984.[30] It is virtually impossible to separate the "upcoding" that occurred from 1983 to 1984 from the change to a higher case-mix and case complexity that resulted from the shift of less severely ill patients to outpatient treatment. It is clear that patients treated in the inpatient setting in 1984 were, on the average, "sicker" than those treated in 1983, due to outpatient shifts. This difference in severity, however, is undoubtedly inflated to some extent by upcoding.

We expected that these changes in hospital utilization and billing patterns would result in the following changes in the three risk-adjusted outcome indexes from 1983 to 1984:

1. We expected that the Risk-Adjusted Complications Index would increase, i.e., show a large increase in the ratio of observed to predicted complications in 1984, compared to 1983. The basis for this prediction is the change to PPS. The presence of complications made no difference under the Medicare payment system prior to PPS, but by 1984 complications did make a difference: for almost 100 conditions there were DRG "pairs," which usually meant that Medicare paid more if co-morbidities or complications were coded. Thus, there were no financial incentives to code complications in 1983, but there were such incentives in 1984. Although there is no way to determine whether the *actual* rate of complications increased as a result of PPS, we definitely expected to see more Medicare cases coded as having complications in 1984. This change in coding would cause the ratio of observed to predicted complications (RACI) to rise in 1984, and to rise more for Medicare than for nonMedicare cases.

2. We expected that the Risk-Adjusted Readmissions Index (RARI) also would rise from 1983 to 1984, primarily because of the decrease in average length of stay which occurred after PPS was put into place. If patients are discharged earlier, there would seem to be a greater likelihood that they will require readmissions. Thus, we expected that the drop in the average length of stay which occurred between 1983 and 1984 would cause our readmission index to rise. We expected a slightly greater increase in the RARI for the Medicare patients, compared to

the nonMedicare patients, since ALOS decreased in both groups, but decreased more for the Medicare patients. Note, however, that we did not expect readmissions to rise dramatically, for two different reasons. First, there was a great deal of concern about discharging patients too soon, and physicians were unlikely to jeopardize their patients' health by discharging them too quickly. Second, the trend toward more complete coding in 1984 would tend to partially counterbalance some of the rise in RARI. As coding became more complete after PPS, it would appear as if there was a "riskier" group of patients hospitalized in 1984, and thus the predicted number of readmissions would be artificially inflated for that year, compared to 1983. Therefore, "upcoding" would probably have kept RARI from rising too quickly between 1983 to 1984.

3. Our expectation for the Risk-Adjusted Mortality Index also takes into account both the upcoding trends and changes in discharge patterns from 1983 to 1984. We expected upcoding to inflate the RAMI slightly from 1983 to 1984, since more complete coding would result in more expected deaths. If this "inflation" occurred, but the quality of care did not change, RAMI would appear to decrease slightly from 1983 to 1984. At the same time, the trend toward earlier discharges would decrease the number of inpatient deaths, since fewer days in the hospital per case meant fewer deaths inside the hospital, as a greater proportion of deaths would occur outside the hospital (either at home or in other settings). Thus, we predicted that RAMI would decrease slightly from 1983 to 1984, due to both upcoding and changes in discharge patterns.

Note that all three risk-adjusted indexes do take into account changes in case-mix and case complexity that occurred due to outpatient shifts. Therefore, the three indexes were not expected to rise or fall between 1983 and 1984 due to changes in case-mix or case complexity.

To test our three indexes against these expectations, we calculated the scores for RAMI, RARI, and RACI, for our sample cohort of hospitals, looking at changes that took place between 1983 and 1984 (see Table 4). For each measure the observed number is shown, along with the number of adverse outcomes that were predicted, based on the case mix and case complexity of the patients treated in these 300 hospitals that we used to test the model. Also, the ratio of observed adverse events to predicted adverse events is shown (Ratio O:P). If precisely the same number of adverse events as predicted actually occurred, then the ratio of O:P = 1.00. However, if more adverse events occurred than we predicted (poorer than normal hospital performance), the O:P would be greater than 1.00.

The indexes of readmissions and complications both showed worsened performance in 1984, particularly for the Medicare (65+) population. This is as we expected. The rather marked increase in RACI shown in Table 4 was as predicted, and probably reflects the greater attention to coding such events after PPS, particularly in the 98 DRGs that paid more for cases with comorbidities or complications. The fact that the increase in RACI was almost twice as great for Medicare patients, compared to nonMedicare patients, was also consistent with our expectations. The finding regarding readmissions also was as expected, given the financial incentives of the Prospective Payment System to discharge patients earlier, and the incentives of PPS to "split up" certain treatments that can be performed in two separate admissions. It is evident that the RAMI showed some improvements from 1983 to 1984 at the hospital level of aggregation, especially for Medicare patients. This means that fewer deaths than predicted occurred in 1984. Also, the decrease in RAMI is greater for Medicare patients than for nonMedicare patients. Thus, it would appear that the RAMI changed in the expected direction.

We were thus able to evaluate the construct validity of RAMI, RARI, and RACI by studying how each index performed before and after the Medicare Prospective Payment System was implemented. All three of the measures changed in the expected directions. Since the responses were consistent

TABLE 4. Changes in Hospital Performance: 1983–1984

	1983			1984			
	Observed Number	Predicted Number	Ratio: O/P	Observed Number	Predicted Number	Ratio: O/P	Change From 1983 to 1984
Mortality (RAMI)							
Age							
<65	13,335	13,030	1.02	13,298	13,517	0.98	−0.04
65+	37,236	36,177	1.03	36,098	39,568	0.91	−0.12
Total	50,571	49,207	1.03	49,396	53,085	0.93	−0.10
Unscheduled Readmissions (RARI)							
Age							
<65	62,179	62,359	1.00	63,708	60,849	1.05	+0.05
65+	46,336	46,150	1.00	48,908	46,233	1.05	+0.06
Total	108,515	108,509	1.00	112,616	107,072	1.06	+0.06
Complications (RACI)							
Age							
<65	16,995	17,019	1.00	19,436	17,224	1.13	+0.13
65+	10,430	10,518	1.00	13,754	11,287	1.22	+0.22
Total	27,425	27,538	1.00	33,190	28,511	1.16	+0.16

with our expectations, there is good support for the claim that the three measures have construct validity.

Discussion

There is a clear need to monitor the outcomes of hospital care, particularly in the years following the introduction of the Medicare Prospective Payment System. The primary question is whether this can be done using the administrative data already reported by hospitals, and collected by HCFA and other organizations, such as CPHA and various insurance plans.

In this paper we have described an approach that was employed for developing a monitoring system based on multiple risk-adjusted measures of adverse consequences. Given the limitations of the present databases, these risk-adjusted outcome measures appear to be very useful for monitoring changes in hospital performance or comparing hospitals. We have now rebased these indexes, using 1988 data. This will allow for risk adjustment, without the confounding effect of upcoding that occurred between 1983 and 1984. The methods are economical, since they are based on existing data. Because such data have been collected for many years, it is possible to observe historical trends, and put recent changes into perspective. The risk-adjusted indexes have face validity, and appear to account for much of the variations in death rates, readmission rates, and complication rates across hospitals. The three risk-adjusted indexes appear to be stable over time, and are not biased with respect to hospital size, ownership, or teaching status. In addition, the three indexes appear to have construct validity, when tested against the changes in hospital care that occurred when PPS was introduced. Moreover, the three indexes are easy to use and interpret by hospitals. Because the measures are based on patient-level data, it is possible to aggregate data at any level, including national; regional; state; hospital; department within a hospital; DRG within a hospital; insurance category; surgical procedure; physicians; etc. This allows for a great deal of flexibility when

using the measures for hospital quality assurance activities.

From a public policy perspective, various approaches to monitoring patient outcomes must be compared and validated. Such analysis will help to determine which approaches are most useful to HCFA, to the Peer Review Organizations, and to hospitals. Some analysis of this issue has already begun (GAO, 1988). It is clear, however, that all of the approaches based on claims data have serious limitations. Additional clinical information is needed to allow for better analysis of the risk factors associated with each outcome for each disease category. The standardized data set collected by Medicare must eventually be modified to include these elements if the database is to be used for quality monitoring. In the meantime, the three risk-adjusted indexes described in this paper appear to provide a valid yet inexpensive method for evaluating several aspects of hospital performance, using existing databases.

References

1. New York Times, March 12, 1986.

2. Rosen HW, Green BA. Mortality lists: A methodology critique. Hosp Health Serv Admin 1987;32:119.

3. Office of Technology Assessment. The quality of medical care: Information for consumers (OTA-H-386). Washington, DC: June 1988.

4. Wennberg JE, et al. Use of claims data systems to evaluate health care outcomes: Mortality and reoperation following prostatectomy. JAMA 1987;257:933.

5. Flood AB, et al. Effectiveness in professional organizations: The impact of surgeons and surgical staff organizations on the quality of care in hospitals. Health Serv Res 1982;17:341.

6. Luft HS, Hunt SS. Evaluating individual hospital quality through outcome statistics. JAMA 1986; 255:2780.

7. Knaus WA, et al. An evaluation of outcome from intensive care in major medical centers. Ann Intern Med 1986;104:410.

8. Kelly JV, Hellinger FJ. Physician and hospital factors associated with mortality of surgical patients. Med Care 1986;24:785.

9. Hebel JR, et al. Assessment of hospital performance by use of death rates: A recent case history. JAMA 1982;248:3131.

10. Fethke CC, Smith IM, Johnson N. 'Risk' factors affecting readmission of the elderly into the health care system. Med Care 1986;24:429.

11. Anderson GF, Steinberg EP. Predicting hospital readmissions in the medicare population. Inquiry 1985;22:251.

12. Gooding J, Jette AM. Hospital readmissions among the elderly. J Am Geriatr Soc 1985;33:595.

13. Riley G, Lubitz J. Outcomes of surgery in the medicare aged population: Rehospitalization after surgery. Health Care Financing Review 1986;8:23.

14. Zook CJ, Savickis SF, Moore FD. Repeated hospitalization for the same disease: A multiplier of national health costs. Milbank Q 1980;58:454.

15. Holloway JJ, Thomas W, Shapiro L. Clinical and sociodemographic risk factors for readmission of medicare beneficiaries. Health Care Financing Review 1988;10:27.

16. Smith DM, Norton JA, McDonald CJ. Nonelective readmissions of medical patients. J Chronic Dis 1985;38:213.

17. Roos LL, Cageorge SM, Austen E, Lohr KN. Using computers to identify complications after surgery. Am J Public Health 1985;75:1288.

18. Brook RH, Fink A, Solomon DH, Kosecoff J, Chassin M. A review of the literature on cholecystectomy: Findings, complications, utilization rates, costs, efficacy, and indications. Santa Monica, CA: Rand Corporation, R-3204/2-CWF/PMT/HF, 1975.

19. Chilton CP, Morgan RJ, England HR, Paris AMI, Blandy JP. A critical evaluation of the results of transurethral resection of the prostate. Br J Urol 1978; 50:542.

20. Adams DF, Fraser DB, Abrams HL. The complications of coronary arteriography. Circulation 1973;48:609.

21. Blumberg MS. Risk adjusting health care outcomes: A methodological review. Med Care Rev 1986;43:351.

22. Moses LE, Mosteller F. Institutional differences in postoperative death rates: Commentary on some of the findings of the national halothane study. JAMA 1968;203:150.

23. DesHarnais S, et al. The risk-adjusted mortality index: A new measure of hospital performance. Med Care 1988;25:1129.

24. Sullivan DF. Conceptual problems in developing an index of health. Washington, DC: US Government Printing Office, #210-981:44, 1976.

25. Knaus WA, et al. An evaluation of outcome from intensive care in major medical centers. Ann Intern Med 1985;104:410.

26. Brewster AC, Jacobs M, Bradbury RC. Classifying severity illness by using clinical findings. Health Care Financing Review 1984;6(Suppl):107.

27. Horn SD, et al. Severity of illness within DRGs: Homogeneity study. Med Care 1986;24:225.

28. Young WW, Swinkola B, Zorn DM. The measurement of hospital case mix. Med Care 1982;20:501

Ave "severity of" wanted, ref same 26 ?

Yes

29. Gonnella JS, Hornbrook MC, Louis DZ. Staging of disease: A case-mix measurement. JAMA 1984;251:637.

30. DesHarnais S, et al. The early effects of the prospective payment system on inpatient utilization and the quality of care. Inquiry 1987;24:7.

Appendix. List of Complications

DX Number	DX Name	DX Number	DX Name
2513	POSTSURG HYPOINSULINEMIA	67402	CEREBVAS DIS-DELIV W P/P
3490	LUMBAR PUNCTURE REACTION	67402	CEREBROVASC DIS-POSTPART
3491	COMPLICATION CNS DEVICE	67410	DISRUPT C-SECT WND-UNSP
47830	VOCAL CORD PARALYSIS NOS	67412	DISRUPT C-SECT-DEL W P/P
47831	VOCAL PARAL UNILAT PART	67420	DISRUPT PERINEUM-UNSPEC
47832	VOCAL PARAL UNILAT TOTAL	67422	DISRUPT PERIN-DEL W P/P
47833	VOCAL PARAL BILAT PART	67424	DISRUPT PERINEUM-POSTPAR
47834	VOCAL PARAL BILAT TOTAL	67512	BREAST ABSCESS-DEL W P/P
5070	FOOD/VOMIT PNEUMONITIS	9954	SHOCK DUE TO ANESTHESIA
5304	PERFORATION OF ESOPHAGUS	9970	SURG COMPLICATION-CNS
65930	SEPTICEMIA IN LABOR-UNSP	9971	SURG COMPL-HEART
66800	PULM COMPL IN DEL-UNSPEC	9972	SURG COMP-PERI VASC SYST
66802	PULM COMPLIC-DEL W P/P	9973	SURG COMPLIC-RESPIR SYST
66804	PULM COMPLICAT-POSTPART	9974	SURG COMPLIC-GI TRACT
66880	ANESTH COMP DEL NEC-UNSP	9975	SURG COMPL-URINARY TRACT
66881	ANESTH COMPL NEW-DELIVER	99762	INFECTION AMPUTAT STUMP
66882	ANESTH COMPL NEC-DEL P/P	9979	SURG COMPL-BODY SYST NEC
66883	ANESTH COMPL ANTEPARTUM	9980	POSTOPERATIVE SHOCK
66884	ANESTH COMPL-POSTPARTUM	9981	HEMORR COMPLIC PROCEDURE
66890	ANESTH COMP DEL NOS-UNSP	9982	ACCIDENTAL OP LACERATION
66891	ANESTH COMPL NOS-DELIVER	9983	POSTOP WOUND DISRUPTION
66892	ANESTH COMPL NOS-DEL P/P	9984	FB LEFT DURING PROCEDURE
66893	ANESTH COMPL-ANTEPARTUM	9985	POSTOPERATIVE INFECTION
66894	ANESTH COMPL-POSTPARTUM	9986	PERSIST POSTOP FISTULA
66912	OBSTET SHOCK-DELIV W P/P	9987	POSTOP FORGN SUBST REACT
66914	OBSTETRIC SHOCK-POSTPART	9988	SURGICAL COMPLICAT NEC
66930	AC REN FAIL W DELIV-UNSP	9989	SURGICAL COMPLICAT NOS
66932	AC REN FAIL-DELIV W P/P	9991	AIR EMBOL COMP MED CARE
66934	AC RENAL FAILURE-POSTPAR	9992	VASC COMP MED CARE NEC
67002	MAJOR PUERP INF-DEL P/P	9993	INFEC COMPL MED CARE NEC
67004	MAJOR PUERP INF-POSTPART	9994	ANAPHYLACTIC SHOCK-SERUM
67300	OB AIR EMBOLISM-UNSPEC	9995	SERUM REACTION NEC
67302	OB AIR EMBOL-DELIV W P/P	9996	ABO INCOMPATIBILITY REAC
67304	OB AIR EMBOLISM-POSTPART	9997	RH INCOMPATIBILITY REACT
67400	PUERP CEREBVASC DIS-UNSP	9998	TRANSFUSION REACTION NEC

Ed: check identical numbers.

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Appendix H

This appendix contains information on the International Classification of Clinical Services (ICCS) developed by CPHA.

THE ICCS CODE: A NEW DEVELOPMENT FOR AN OLD PROBLEM

Stanley Mendenhall

Reprinted from PROCEEDINGS OF SCAMC — SYMPOSIUM ON
COMPUTER APPLICATIONS IN MEDICAL CARE,
Washington, DC, November 1-4, 1987

The ICCS Code: A New Development for an Old Problem

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Commission on Professional and Hospital Activities
Ann Arbor, MI 48106

ABSTRACT

CPHA has developed a new classification system for hospital services, the ICCS (International Classification of Clinical Services). The codes are designed to organize hospital billing data so it is more accessible and useful for both clinical and financial applications. This coding structure has been adopted by over 100 hospitals in the United States since the beginning of 1987.

The paper describes the underlying principles and the development process of the ICCS code.

1. Introduction

A friend of mine who teaches industrial engineering once surprised me by saying that 80 percent of the cost of running a hospital lies in exchanging and transmitting information - -a statement I was inclined to doubt until I realized exactly what information exchange entails. In hospitals it involves not only the administrative components -- communication between patients and physicians, hospitals and insurance companies, nurses and physicians, public relations and the public, administrations and boards -- but also the medical components. Blood levels, x-ray interpretations, diagnostic test results -- these are only a small part of the clinical information conveyed to the managing physician. When you add the cost of organizing, storing, and computerizing all this information, 80 percent begins to seem more plausible.

The computerization of the hospital, gradual in some areas and abrupt in others, has resulted in the proliferation of systems. A single facility may have separate systems for laboratory, pharmacy, billing, risk management, and utilization review. At the same time, many hospitals feel torn in two directions, between the level of specialized detail in their stand-alone satellite data bases and the universality and efficiency of an integrated HIS -- a Hospital-wide Information System. Many have tried to "automate the chart," and there are, in general, many more failures than successes.

These failures do not come from our inability to computerize mountains of detail. Look, for instance, at the CT Scans and MR Scans routinely stored on magnetic tape, and computerized systems available for almost any department in the hospital. In fact, now we tend to assume that we're working in the Stone Age if we haven't computerized every task, however mundane. In an ironic variation on the "garbage in, garbage out" theme, we sometimes act as if we can take "garbage in" and put "gospel out."

Instead, I think, part of the problem is this -- many of us need information about what's going on in other areas of the hospital, but not at the excruciating level of detail the specialist needs. Internists need to know what drugs their patients are getting; radiologists need to know about allergies and potential reactions to contrast media. In short, non-specialists need to know what's happening, but in terms that are relevant to their own information needs.

This means that the level of detail which is important or relevant for specialists needs to be "summarized" to a higher level of understanding for non-specialists -- something that's both correct and understandable. One example: The specialist needs to know that prothrombin time has been extended; the non-specialist needs to know only that the patient is a "bleeder."

Here I'd like to review hospital information systems briefly. As we all know, most hospitals have automated their billing functions. These billing systems accumulate data on orders, treatments, tests, and other therapies for presentation to third party payors. Third party payors are then expected to pay for an itemized list of all the drugs, supplies, and services provided.

Note that the detailed transactions are a by-product of this ordering process, generated from specific physician orders. Since provider reimbursement depends on these transactions, hospitals have a major incentive to generate them. These data bases, as a result, are quite large and virtually universal among hospitals.

However, these data bases are seldom if ever used for any type of clinical management applications, in part because they lack much of the clinical information needed. One example is diagnostic test results, where the typical billing system does not include the examination results (blood pressure, temperature, etc.) needed for clinical consideration. I would still argue, though, that the main reason billing data bases are not used

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for clinical applications is the coding structure they use to identify the services.

Figure 1 displays a typical section from a hospital's charge code master file. This hospital bills for oral Amoxicillin, in both solution and capsule form -- information that could be useful in antibiotic reviews. But look how the service is identified. Here Amoxicillin in 250mg capsules appears as code number 690315-7 -- a number arbitrarily assigned by the hospital's accounting department. Each hospital's accounting department will assign a different number for Amoxicillin capsules, and thus this data is of little use in comparative studies.

[redacted] MEMORIAL HOSP. ASSOCIATION, I ACCOUNTS RECEIVABLE

ACTIVITY DESCRIPTION INDEX

69 - PHARMACY

ACT AREA	DESC CODE	ACTIVITY DESCRIPTION	UNIT PRICE
69	0271-2	AMINO-CERV REFILL	18.20
69	0281-1	AMINOPHYLLIN 100MG TAB	.35
69	0282-9	AMINOPHYLLIN 200MG TAB	.35
69	0292-8	AMINOPHYLLIN SUPP 0.25GM	1.35
69	0293-6	AMINOPHYLLIN SUPP 0.5GM	1.50
69	0303-3	AMINOSALICYLIC ACI EC 500MG TAB	.35
69	0310-8	AMOXICILLIN DROPS 50MG/ML 15CC	7.15
69	0311-6	AMOXICILLIN 125/5 100ML	11.00
69	0312-4	AMOXICILLIN 125MG/5 UD	3.95
69	0313-2	AMOXICILLIN 250/5 5CC UD	4.30
69	0314-0	AMOXICILLIN 250/5 100CC	16.10
69	0315-7	AMOXICILLIN 250MG CAPS	.70
69	0316-5	AMOXICILLIN 500MG CAPS	1.20

Figure 1

"Typical" Hospital Charge Code Master File

2. Enter the ICCS

Back in 1982 when I first started working at CPHA, HCFA had just mandated DRGs. Hospitals found it necessary to merge their billing data with medical record data to generate DRG Profit and Loss Statements. It occurred to me at the time that there was a wealth of clinical information in billing data; however, it seemed most rational to try to organize it for more than one hospital's benefit. At this point CPHA went to Abbott-Northwestern Hospital to propose the development of a "Universal Charge Code" which would benefit not only Abbott-Northwestern but also many other institutions. A later proposal to the University of Alberta Hospital necessitated a name change to accommodate Canadian reimbursement structures; at this point we renamed the code the "International Classification of Clinical Services." Its goal is quite simple: to identify the "three Cs" of clinical services, or items significant from the standpoint of Cost, Quality of Care, and Comparative Relevance, in all hospital service areas. This meant approaching clinical experts in laboratory, pharmacy, radiology, respiratory medicine, cardiology, orthopedic surgery, and nursing, as well as experts from "non-clinical" areas like social services, discharge planning, and dietary services.

In developing the ICCS code we emphasized the taxonomy of the functions performed by the various areas of the hospital, as opposed to the specific technology. This is because the functions performed will remain relatively static but the technology will change over time. Chest x-rays, for instance, may be displaced by Ultrasound, Fluoroscope, CT Scan, or MRI. Different information will be obtained, to be sure, but the entity under review is still the chest.

The development of the ICCS coding structure involved several distinct steps:

(1) Development of "dimensions"

The dimensions of the code are those items of relevance from a clinical or cost perspective which need to be provided for in the retrieval process.

Table 1 describes the specific digits of the ICCS code and their interpretation. The ICCS code is 12 digits or less; and the table indicates, for example, that the source of a lab specimen is contained in digits 10 and 11 of the ICCS code.

Table 1

ICCS STRUCTURE

DESIGNATION OF SIGNIFICANT DIGITS

Digit	Laboratory	Imaging	Drugs
1	Lab	Imaging	Drugs
2	Traditional Department	Traditional Speciality	Therapeutic Category
3	Generic Test	Generic Test	
4			Generic Drug Name
5	Specific Test	Technique	
6			
7		How Ordered	Route of Administration
8	How Ordered	Views	Dosage Form
9	Panel/Ind	Contrast Media	
10	Specimen Source		Strength
11		Bilateral Unilateral	
12	Test Measure		Unit Measure

(2) Development of "trees"

The trees are the analysis of relevant possibilities for each of the dimensions. In general the trees start with a root and branch downward into various alternatives.

Figure 2 displays the trees associated with the various dosage forms, and strengths of Warfarin, an anticoagulant.

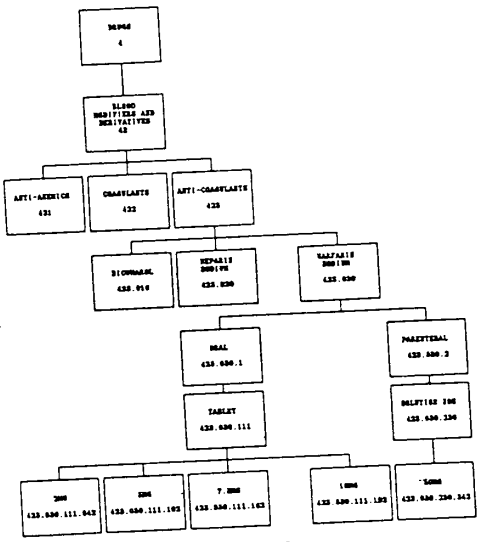

Figure 2

ICCS Hierarchy for Warfarin

As can be seen as successive levels of detail are added -- route, dosage form, and strength, the information becomes more specific. It is also important to note that a typical hospital will bill for the lowest level of detail, e.g. 2 mg tablet of Warfarin, however, it needs to retrieve information at a higher level of detail (i.e. did the patient receive an anticoagulant?).

3. What does an ICCS code look like?

Figure 3 shows the coding structure for a 500mg dose of Kanamycin in capsules.

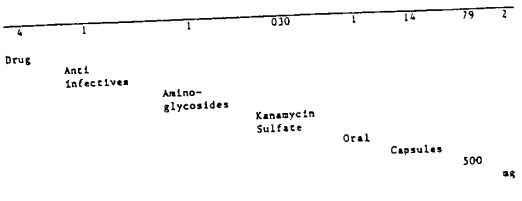

Figure 3

ICCS Code for Kanamycin 500mg capsules

As can be seen, the ICCS code allows retrieval of route of administration (oral), therapeutic category and subcategories (anti-infectives, aminoglycosides), generic drug name, dosage form (capsule), and strength (500mg). All of these data elements may be relevant in one form or another for specific QA or P&T committee studies. This hierarchical structure serves both specialists and non-specialists, who can review the information in the level of detail they need -- here to note the use of anti-infectives.

Figure 4 illustrates the coding structure for Thyroid Stimulating Hormone, a laboratory test.

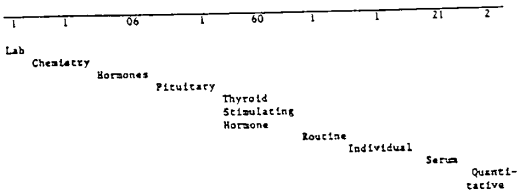

Figure 4

ICCS Code for TSH
(Thyroid Stimulating Hormone)

The laboratory coding structure allows the retrieval of the generic group of tests (chemistry, hormones); the specific test (TSH, a pituitary hormone); that it was done routinely, not stat; and that the results were quantitative, not qualitative, from a serum sample.

4. ICCS Design Principles

My hardest decision in 1984 was how long the ICCS code should be. Long codes give you lots of "slots" to store data, but they're error-prone; short codes may be easier to use, but they can't store as much information. The following principles of code design were developed largely "after the fact," the result of making mistakes and renumbering hundreds of services.

Rule 1: A service should appear in only one place.

Tests like arterial blood gases can be performed in a number of sites within the hospital. Creating separate ICCS codes for each site would unduly complicate the retrieval process.

Rule 2: Don't build irrelevant information into the code.

The code classifies services. These should be the same no matter who the patient is, who provided the service, or where the service was provided. These other elements are important too, but they're distinct from the service itself.

Rule 3: Form follows function. Emphasize what rather than how.

A truism of twentieth-century architecture holds that "form follows function." The ICCS likewise considers "what," not "how," paramount.

Coding structures could differentiate lab tests like the CBC according to the equipment used -- Gillford, Orthodiagnostic, or Coulter. Similarly, the structure could differentiate identical drugs produced by different manufacturers. But, if there are no clinical, cost, or other relevant differences between similar services -- if they use different forms but serve the same function -- don't differentiate them in the coding structure.

Rule 4: The sum or the parts? The component or the assembly? There is no hard and fast rule.

Many tests or treatments are provided in clinical groups because they're all clinically relevant. For example, a patient may receive a combination drug, like an antihypertensive with a diuretic, or a lab panel test. The coding structure could be developed to identify just the specific components of the assembly, or just the assembly itself. A practical example is the CBC, Complete Blood Count, which actually measures 10-20 specific values, depending on the machine and institution. Theoretically, the structure should code only the individual data elements provided by the CBC rather than the CBC as a whole. As a practical matter, though, the CBC is ordered so frequently that the information loses its practical value if you try to analyze all the values.

Rule 5: NEC means "none of the above," NOS means "that's all I know."

NEC stands for "Not Elsewhere Classified," and NOS means "Not Otherwise Specified." NEC indicates that the subcategories don't describe all of the available options, while NOS means that no further information can be gleaned from the sources on hand.

New drugs and supplies appear on the market every week, long before their final classification. "NEC" lets you classify them correctly, if not as precisely as you might like. The NOS category recognizes that many who map or use ICCS codes may not have specialized training; NOS lets them quit while they're ahead. When you have no more information, then, use NOS.

As with ICD-9-CM, most NOS categories end in 0, most NEC in 9.

Rule 6: Develop a coding structure robust enough to accommodate change.

The current coding structure and trees identify the technology now available. While this will change, the basic medical processes will not. For example, diagnostic imaging identifies the body part under study with the first four digits, and the imaging equipment with the next two. New imaging techniques can be incorporated simply by adding new technique codes, since the body part stays the same.

Rule 7: Don't waste good codes on bad medicine.

Current systems include many codes for procedures which have fallen out of practice due to patient risk or obsolete technology. In developing the ICCS structure, our physicians were asked to incorporate the "state of the art" in American Medical practice.

Rule 8: Don't code research, code practice.

Much current medicine verges on research. Trying to capture data from the procedures performed by researchers -- immunological studies for transplant reactions, for instance -- wastes their time and adds little to the data base. Our aim is to compare actual practice between facilities. Those most interested in comparing research activities between facilities are other researchers.

Rule 9: Don't be constrained by the practices in any hospital, state, or country.

Over and over people have told me, "We don't do it that way," and "Our hospital doesn't charge for this." The coding structure must be broad enough to transcend hospital, state, and even national boundaries. If it's relevant to the patient, it should be classified and collected. Conversely, just because a hospital doesn't charge for a service doesn't mean it shouldn't be classified. Dietary consults and special meals, for instance, are typically not charged by the hospital, but they're highly relevant to patient care and they do cost money.

Rule 10: The code is designed to be accurate but not precise.

The code can accommodate much more detail than typical in hospital billing or medical record abstracting systems. Any classification system will lose some information; the greater the precision, the less the accuracy. Precision requires more differentiations among services, and thus more codes. Striving for accuracy simply means recognizing the limitations of the data; if more information is not available, NOS is the right classification.

Rule 11: The coding structure walks a fine line between physicians, provider, patient, payor, and supplier.

Each of these constituents has a say in the payment, financing, delivery, and receipt of health care services. A coding structure which accommodates only one interest will have trouble finding acceptance among other parties. A perfect example: CPT-4 coding classifies physician procedures, not drugs or supplies; the NDC (National Drug Code) classifies drugs but not supplies. Our aim is to classify services delivered by the whole range of providers.

Rule 12: It may not be practical to collect everything in the ICCS system today, but that doesn't mean we shouldn't try.

Hospital billing systems are often inaccurate and incomplete, and many fail to provide the specific detail required in the ICCS code. We acknowledge this; however, the ICCS taxonomy provides an example of how ICCS should be incorporated into hospital information systems in the future.

Rule 13: Don't classify what an item is, classify what's different about it.

Many of the subcodes of ICCS require compromises in interpretation in order to differentiate similar items. For example, the same "root" code is used for Estrogen Receptor Assay as well as Serum Estrogen. Both these tests are listed under Estrogen; the way they are differentiated is by specimen source -- tissue biopsy in the case of Estrogen Receptor Essay, and Serum in the other.

Most clinicians would object to clumping ERA with Estrogen. However, the main issue, i.e. differentiating the tests, has still been accomplished. This rule results in reducing the proliferation of "new" codes for services which are essentially similar to ones which are already available.

5. How the ICCS is implemented

It would be impractical to code individual patients with ICCS services, as in abstracting patients' charts with ICD-9-CM codes. This is because, by and large, ICCS codes emphasize individual components, drugs, supplies, and other tests and treatments, whereas ICD-9-CM and CPT-4 emphasize specific surgical procedures. Even when drug and supply information exists, it's not coded for medical record data bases. For example, the ICD-9-CM code for the injection of an antibiotic is 99.21; the ICCS coding identifies the specific drug, route or administration, and dosage form and strength, with more than 500 codes for specific antibiotic combinations.

The best way to implement ICCS codes is map a hospital's charge codes into an ICCS code. The implementation of a cross-reference code eliminates the effort for collecting information from the chart. Once the cross-reference has been established, it is possible to retrieve the information contained in the ICCS code each time the hospital bills for the service.

Figure 5 displays the overall systems flow for the process of implementing ICCS in a hospital. As can be seen, a medical record abstract with ICD-9-CM codes is merged with a patient's billing data; cost information is added to calculate hospital specific costs for the individual procedures contained on a patient bill.

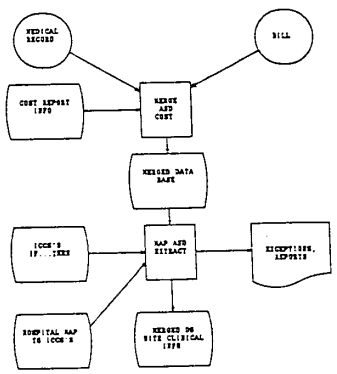

Figure 5

Overall Systems Flow

The bottom portion of the flowchart displays the mapping process; hospitals map their charge codes into ICCS codes -- a sample mapping form is displayed in Figure 6.

ICCS	ICCS DESCRIPTION	MAPPING FROM ITS CHARGE CODE
442.130.122.342	PHENYTOIN SUSP	5,0,0,18,7,9,8
471.130.129.932	THEOPHYLLINE 80 MG/15 ML SYRUP	5,0,0,18,8,2,2
689.520.111.152	METOCLOPRAMIDE 10 MG	5,0,01,8,8,3,3
445.240.111.794	TRIAZOLAM 0.5MG TAB	5,0,01,8,8,41
444.230.111.342	IMIPRAMINE 50 MG TAB	5,0,01,8,8,8,5
445.210.114.282	FLURAZEPAM 30 MG (DALMANE) CAP	5,0,01,8,8,90
447.210.111.352	BACLOFEN 20MG(LIORESAL DS)TAB	5,0,01,8,9,36
453.163.116.279	POTASSIUM CHLORIDE 25 MEG PKT	5,0,01,8,9,85
441.715.111.912	IBUPROFEN 600 MG (MOTRIN) TAB	5,0,01,8,9,87
472.080.114.372	DIPHENHYDRAMINE 50 MG CAP	5,0,01,9,0,35
434.220.111.342	ATENOLOL 50MG(TENORMIN)TAB	5,0,01,9,0,78
439.770.111.362	PROPRANOLOL 60MG(INDERAL) TAB	5,0,0,19,0,95

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Figure 6

Hospital Mappings to ICCS Codes

A sample of the knowledge base (If..Then rules) is displayed in Figure 7. The upper portion identifies a specific ICCS code for a drug; the lower portion identifies the ICD-9-CM diagnoses codes that one would expect to find if a patient received the drug. Exceptions to this rule could mean a variety of things -- undocumented or uncoded diagnoses, billing errors, medication errors, or other problems.

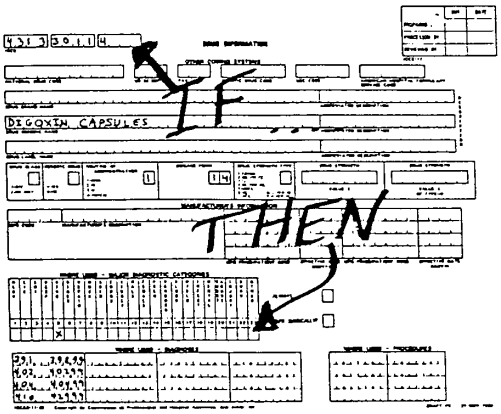

Figure 7

ICCS Knowledge Base (If..Then Rules)

6. Applications of ICCS Codes

Once we have a common "language" for services, it's relatively easy to start developing rudimentary knowledge bases with that language. Examples from two very different areas illustrate how we can develop applications:

6.1. Billing audit knowledge bases

One practical application is the identification of all services which should be provided to patients with certain diseases or surgeries. Thus, for instance, one could define a set of rules for hip-implant patients as follows:

If Hip Implant, then the following items should be billed:

- Hip prosthesis
- Operating Room Time
- Anesthesia Time
- Sutures
- Etc.

Hip implant patients can be identified by the ICD-9-CM procedure code, and the minimum services outlined above can be identified by ICCS codes. A hip-implant patient for whom all the above items are not listed represents a loss of revenue to the hospital.

6.2. "Reverse Protocols"

The example above represents a billing "protocol" for patient treatment. A "reverse protocol" basically starts from clinical services and works backwards--that is, if a patient was billed for hip implant, then the patient should have had hip

surgery. The "reverse protocol" rules are relatively easy to develop; each of the clinical areas defines the purpose of its clinical services and what problems they're used for as defined by ICD-9-CM codes, body systems, or other classification methodologies. A patient billed for a service with no underlying problem represents an exception to be investigated for possible inadequacies in documentation, billing, or the reverse protocols themselves. Some examples of exceptions in our pilot hospitals:

Reverse Protocol Rule: If Flurazepam in 30mg dose, Age is under 65.

Flurazepam (Dalmane) is a sleeping pill available in 15mg and 30mg doses. Elderly patients have difficulty metabolizing the drug and therefore are more susceptible to falls. Therefore a 15 mg dose of Flurazepam is recommended for elderly patients. We used the "reverse protocol" above to identify a large group of elderly patients who had received 30mg doses. On further investigation we found that most of the 30mg doses came in response to a standing order for "post-surgery, Dalmane 30mg." After consultation, clinicians changed the standing order to "post-surgery, Dalmane 30mg; if over 65, Dalmane 15mg."

Reverse Protocol #2: If Naloxone, then narcotic overdose.

Naloxone is a drug designed to counteract narcotics. With the reverse protocol we found that most patients received it to counter-act anesthesia, and another six percent showed diagnoses related to substance abuse. In other cases, though, patients received it to counteract narcotics administered on the nursing floor. These patients had received excessive dosages of pain-killers, and needed Naloxone to reverse the reactions. The net result was a quality assurance issue for review, as well as the identification of excess costs due to the administration of both narcotic and Naloxone.

7. Who's got the ICCS?

At the present writing (August, 1987), ICCS codes have been implemented in eighteen hospitals and are in the process of implementation at 100 others. In 1987 we plan to publish the ICCS alphabetic and tabular indexes; after that, it will probably be necessary to reissue the volumes every year to accommodate new technology, drugs, and other services. There are currently about 1,500 ICCS codes for Laboratory Services, 1,500 for Diagnostic Imaging, and 7,000 for Drugs. Other ICCS codes are currently under development for Supplies, Anesthesia, Cardiology, Respiratory Therapy, Physical Medicine, Nursing and other areas.

8. Summary

The ICCS concept represents a change in the use of hospital information systems by proposing that we make optimal use of a data base that already exists -- the hospital billing base. This task is relatively simple, economically attractive, and minimally disruptive to ongoing hospital data operations.

We see the ICCS as the structure for a common language uniting specialists and non-specialists. By merging clinical and financial data in a single source, it cannot only deliver us from the chaotic state of hospital information collection we see today but also free us for the goals our information is, after all, designed to serve: The ongoing analysis of both the cost and quality of care we provide for our patients.

REFERENCES

1. Mendenhall, S.: Beyond Case-Mix Management: The Need for a Classification System for Diagnostic and Therapeutic Services, Hospital Privileges and Specialty Medicine. Evanston, IL. American Board of Medical Specialties, 1986, p. 90.

2. Mendenhall, S.: QA Update. The use of billing data in quality assurance; Quality Review Bulletin, January 1987, Volume 13/Number 1.

3. Mendenhall, S.: 'Reverse Protocol' approach to quality offers specific look at services provided; Modern Health Care, May 22, 1987.

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I would like to thank Linda Harbison for her help in preparing this manuscript.

January 1987
Volume 13/Number 1

QRB
Quality Review Bulletin
Journal of Quality Assurance

The Use of Billing Data in Quality Assurance

Stanley Mendenhall

The Use of Billing Data in Quality Assurance

Quality assurance (QA) in hospitals has typically gone the way of the cobbler's children who have no shoes: despite the fact that the main mission of hospitals is to provide high-quality health care, QA activities are often performed with the most rudimentary of tools. Although hospital financial information systems have expanded from accounting machines into "totally integrated systems," their main purpose has always been clear: to bill for the services provided to patients. Meanwhile, the QA department may struggle with manual chart reviews to gather bits of information that might indicate existing or potential quality problems. The increasingly frequent need for chart reviews (eg, by peer review organizations and commercial insurance companies) has increased the average number of reviews per chart to about 4.5 in one hospital recently reviewed by the Commission on Professional and Hospital Activities (CPHA). Hospitals find it increasingly difficult to justify the cost of staff used to perform chart reviews, given the financial constraints under which hospitals operate.

CPHA has devised a methodology by which a hospital can use the largest internal data base at its disposal—the billing data base—to assist in monitoring some components of the quality of patient care. By using a data base that has already been established, the most expensive part of an information system—data collection—will be eliminated or significantly reduced.

The use of billing data, however, has limitations for QA purposes. Billing data often do not have drug details or diagnostic test results, nor can they include nursing notes or interpretative reports. For the information they do contain, however, billing data have several advantages. First, they are available. Second, the billing data base is the information that is reviewed by third-party payers to determine payment and even quality of care (such as in studies of mortality rates). Third, many hospital billing systems identify laboratory tests, drugs, medical and surgical supplies, and other specific services provided to patients.

CPHA's methodology was developed at a large (more than 500 beds) midwestern acute care hospital and is undergoing a two-year pilot study. The goal of the project is to enable hospitals to access data by specific physician order; by accessing information at this level of detail, it is possible to compare practice patterns between institutions for similar case types.

The basis of the methodology is a new coding structure, called the International Classification of Clinical Services (ICCS). It provides detailed information about specific laboratory tests, diagnostic imaging procedures, and pharmacy services. The ICCS provides a method for organizing billing data so that they can be analyzed as part of QA activities.

Billing data have not been more widely used for QA analyses because billing system charge codes themselves do not usually convey detailed clinical information; they are simply unique codes used in hospital billing offices to identify and price specific services provided to patients. For example, Tylenol 325 mg tablets may have a charge code of 12345. Tylenol caplets may have a completely different charge code. Thus, anyone who wanted to review all usages of Tylenol would need to know all dosages, forms, and routes of administration of Tylenol and their corresponding hospital charge codes in order to retrieve information about use of this drug from a billing data base. To further complicate matters, if a hospital uses the generic substitute for Tylenol (acetaminophen), then one would need to know the hospital charge codes for its forms as well.

The ICCS differs from hospital charge codes in that the code itself contains organized information about the services offered. For example, the ICCS code for a diagnostic imaging procedure would reveal the type of test (ie, imaging procedure), the appropriate subdepartment, the type of procedure, the technique, the method of ordering, and the contrast medium (see Figure 1, page 32). Similar information is available through the ICCS codes for laboratory tests and for pharmacy and drugs (see Figure 2, page 32).

The components of the ICCS code allow analysis of hospital activities from a variety of standpoints.[1] For example, one might wish to examine the route of administration of antibiotics to see if oral drugs could be substituted for drugs administered parenterally. In order to identify patients receiving oral antibiotics, one would need to know both the route of administration (ie, oral) and therapeutic category (ie, antibiotics) of drugs provided to patients. This taxonomy or classification is not available in most billing systems.

With a data base such as the one described, it is possible to address some issues in QA and cost contain-

ment. Some of the specific topics researched in CPHA's pilot project include the following:

1. *Flurazepam (Dalmane) usage.* Flurazepam is a hypnotic agent useful for the treatment of insomnia. It is often prescribed for hospitalized patients. Side effects of overdosage include dizziness, drowsiness, staggering, and ataxia. The *Physicians' Desk Reference* recommends that elderly patients should not receive more than a 15-mg dose of the drug. By using a data base with the level of detail described, CPHA has been able to identify patients over 65 years of age who have had a 30-mg dosage of Dalmane, their diagnoses, their attending physicians, and their physicians' specialties. A review of a three-month sample of data identified 90 patients over age 65 who had received 30-mg doses of Dalmane. Further research revealed that most of those patients were under the care of cardiologists, and the prescription was generated from a standing order that read "Post Surgery, Dalmane 30 mg." The pharmacist who identified this problem has recommended that the standing order be modified to read "Post Surgery, Dalmane 30 mg; if patient over 65 years, Dalmane 15 mg." It is not known whether any of the 90 patients who received a 30-mg dose of Dalmane developed complications. However, it is clear that there would be increased risk to these patients.

2. *Cefamandole nafate (Mandol) and coronary bypass surgery.* Mandol was being used as a prophylactic drug to prevent and treat infections in coronary bypass surgery patients. CPHA was able to divide the group of coronary bypass surgery patients into patients who developed infections and patients who did not develop infections. For patients who did not have infections, the dosage of Mandol varied from 5 gm to 20 gm per patient. This information could be presented to the patients' surgeons to determine whether the different dosage regimens were related to the patients' weight or other clinical factors or whether there are methods of standardizing the dosage. Mandol is a relatively expensive drug; a uniform dosage regimen could reduce costs.

3. *Antibiotic usage.* The ability to identify all antibiotics and their usage in patients allows the pharmacy and therapeutics committee to address efficiency and cost issues as well

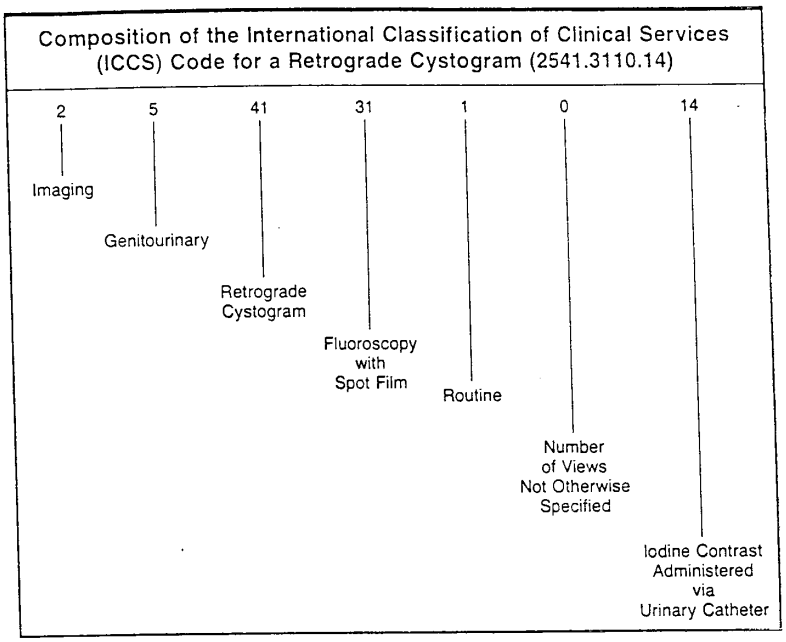

Figure 1. *Explanation of the ICCS code for a retrograde cystogram.*

Information Available Through International Classification of Clinical Services (ICCS) Codes

Laboratory
Subdepartment (eg, chemistry, hematology, immunology)
Generic type of test (eg, carbohydrates, hormones)
Test (eg, glucose tolerance test)
How ordered (eg, routine, immediate)
Source of specimen (eg, serum, urine)
Test measure (eg, qualitative, quantitative)

Diagnostic Imaging
Subdepartment (eg, neurologic and head, bone and joint, GI)
Generic type of procedure (eg, head, chest, abdomen)
How ordered (eg, routine, immediate, portable)
Contrast media (eg, none, iodine)

Pharmacy and Drugs
Therapeutic category (eg, antihistamines, antibiotics)
Generic drug (eg, acetaminophen)
Route of administration (eg, oral, intravenous)
Dosage form (eg, tablet, capsule)
Strength/dose (eg, 325 mg)

Figure 2. *The ICCS code for ancillary services can convey clinical information.*

as appropriate use of antibiotics. Table 1 (this page), which was generated from the CPHA pilot hospital's summary of data for three months, displays antibiotic use and its cost for patients who had infections and those who did not have infections. This analysis reveals that more money is spent to prevent infections than to treat them. The availability of data such as these makes it possible for medical staff and administrators to weigh the cost of preventive treatment against its value. These data might pose the following questions:

- What savings are possible if there is a decrease in the infection rate in cardiovascular surgery or general surgery?
- In orthopedic cases, why is there so little difference in the cost of antibiotic usage per case for patients with infection and patients without infection?
- Why are antibiotics used to such a large extent to treat medical patients who do not have infections?

These questions help medical staff and hospital administrators both to improve the quality of care and to save money.

4. *Anticoagulant therapy and hip surgery.* Anticoagulants (eg, heparin and warfarin) are usually prescribed for patients who have undergone hip surgery. This practice prevents pulmonary emboli, which can be life threatening. In the pilot hospital, CPHA staff members were able to use the data base to identify six patients who had not been given anticoagulant therapy for a variety of reasons, including changes in attending physicians and emergency admission of the patients; in short, omission of anticoagulant therapy was an oversight in most of the cases. Because they had this information, the hospital's vice-president of medical affairs and the pharmacist were able to change the procedures for this type of surgery to ensure that the problem would not recur.

5. *Heparin injections and platelet counts.* Patients are given heparin in a variety of situations in which it is necessary to inhibit clotting. When patients have extensive heparin therapy, it is possible that their platelet counts could be depleted to the extent that the patients' blood would not clot at all. CPHA staff members were able to use the data base to determine whether patients undergoing heparin therapy had also had platelet counts performed and to initiate appropriate procedures, if necessary, to ensure that baseline measures of platelet function were available.

Table 1. Summary of Antibiotic Usage and Costs

	Cases	Total Antibiotic Costs	Average Antibiotic Cost/Case
Medical Cases			
Infected	110	$ 33,880	$308
Not Infected	990	125,730	127
Cardiovascular Surgery			
Infected	12	6,120	510
Not Infected	108	18,900	175
Orthopedic Surgery			
Infected	10	1,400	140
Not Infected	110	9,350	85
General Surgery			
Infected	34	21,352	628
Not Infected	226	38,646	171

6. *Therapeutic drug monitoring and drug therapy.* Many drugs (eg, quinidine, digoxin, lithium) become toxic if they are given in doses that are too large. Patients receiving these drugs must have their blood monitored to assure that they are not receiving toxic doses. The ICCS data base enables hospital staff to identify patients who received the drug but who did not receive therapeutic drug monitoring as well as patients who may have had an excessive number of monitoring tests.

Conclusion

CPHA has found that the ICCS codes provide hospitals with the ability to organize their data to examine the quality and appropriateness of patient care. So far, the methodology has proved most useful in analyzing drug usage. Using the system to study drug utilization could be valuable to hospitals; according to one study, almost 20% of potentially compensable events are the result of the inappropriate use of biologics and pharmaceuticals.[2] In the future, CPHA will test this methodology further in 12 hospitals from a multihospital system and enhance the data base by incorporating diagnostic tests.

The ICCS methodology allows hospitals to use the largest internal data base available—the billing data base—for some QA activities. Billing data have obvious limitations: sometimes the data are not accurate and they do not include key clinical values such as diagnostic test results. When combined with information on diagnoses and procedures from the medical record, however, billing data can provide a wealth of information for QA, risk management, pharmacy and therapeutics, and cost containment issues.

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References

1. Mendenhall S: Beyond case-mix management: the need for a classification system of diagnostic and therapeutic services. In *Hospital Privileges and Specialty Medicine*. Evanston, Ill.: American Board of Medical Specialties, 1986, p 90.

2. California Medical Association (CMA): *Report on the Medical Insurance Feasibility Study*. San Francisco: CMA, 1977.

Appendix I

This appendix contains an example of the advice offered to hospital board members on how to approach and interpret the large amounts of quantitative data available to them for evaluating the quality of care at their institutions.

Kieron Waeske

THE QUALITY LETTER
for Healthcare Leaders

Volume 2 Number 8
October 1990

Sample Board Reports

"Hospitals, if they wish to be sure of improvement, must find out what their results are..."

Ernest A. Codman, MD
Chairman
American College of Surgeons
Hospital Standardization Committee
1914

Interpreting Quality Reports: Questions the Board Should Ask

Governing Boards possess the final accountability for quality, just as do they for financial performance and strategic planning. The achievement of good clinical outcomes and patient satisfaction is as much a Board concern as achievement of budget goals and market objectives.

To carry out their responsibility for quality, Boards receive an ever-growing array of information — from quality indicators to risk management reports to credentials summaries. This information is valuable, but by itself is only one component for exercising the Board's responsibility. Equally important is how the governing body interprets and uses information on quality.

"We give the Board all this information, but they ask hardly any questions" is a frustration commonly voiced by CEOs, quality managers, and medical directors who prepare information for the Board.

This issue of THE QUALITY LETTER focuses on how Boards can interpret and use reports on quality. We will depart from our usual article format and instead present six examples of reports on quality designed for a Governing Board or a Board Quality Committee. For each sample report, we will suggest questions that Board members might ask when they review this information.

Questioning at the Board level is both art and science. The foundation is a relationship of trust and collaboration among the Board, management, and medical staff leadership. Knowledgeable Board members who understand their responsibility for quality are able to review reports and raise questions in a constructive manner. The process of answering — and being prepared to answer — the questions of an informed Board also helps management and physicians keep their priorities in focus.

Readers are encouraged to share this issue of THE QUALITY LETTER with all the members of their Boards, and with their organization's managers and physicians who prepare information on quality for the Board.❖

Quality Indicator Report

Report Components

This report includes selected statistical indicators that reflect important dimensions of the quality of patient care and patient services. To keep the sample report to one page, only seven indicators are shown. An actual report probably would include additional indicators. In examining the sample report, keep the following in mind:

- Numbers alone cannot be equated with quality, but careful, regular review of meaningful indicators can give important insights into quality. Indicators should be used in conjunction with other reports, such as Quality Management Activities (see page 6) and Patient Satisfaction (see page 12). Indicators are a starting point for asking questions about quality.
- The number and choice of indicators should be individualized to your healthcare organization. You may choose more, fewer, or different indicators for reporting to the Board. While quality indicators are usually selected to monitor problematic areas, "good news" reporting is also valuable to the Board.
- Note that each indicator is briefly defined on the same page on which the data appear. This enhances Board understanding.
- Data for the current quarter, previous quarters (for two years), year-to-date, and a comparison group are shown. Showing only the current data — *eg*, one month or quarter — is a "snapshot" that at best gives a partial picture and at worst is misleading. Statistical indicators always should be trended over time and shown, if possible, in relation to a comparison group (*eg*, data from your multihospital system, a government agency, or the Maryland Hospital Association's Quality Indicator Project).

Questions the Board Should Ask

1. *Choice of indicators.* How were these indicators selected? Do these indicators cover the scope of services provided by the hospital? Do they reflect important aspects of patient care or patient services? Are there additional indicators that the Board should review?
2. *Comparison figures.* Are there accepted standards or published statistics to which the hospital's rates may be compared? If the hospital's rates vary significantly from the norm, can we explain the variation? Is it due to factors involving our patients? Data collection methods? Staffing and organization? Treatment practices? Other factors?
3. *Thresholds for evaluation.* Are there "thresholds for evaluation" — *ie*, levels which trigger further review by management and the medical staff? Have these been triggered for any of the indicators? For example, under "Left AMA/Emergency Dept." in the sample report, would "4.0%" in the "2nd quarter 1989" column trigger an evaluation?

   If no indicators have been triggered for further review, why not? Have we set our "thresholds" appropriately?
4. *Fluctuations and explanations.* Are there sharp fluctuations in rates or numbers for any time periods, *eg*, quarter to quarter, or year to year? If so, is there a reasonable explanation, or do the data indicate a problem? For example, under "Hospital-acquired infections" in the

(Text continues on page 5.)

> "Numbers alone cannot be equated with quality, but careful, regular review of meaningful indicators can give important insights into quality."

Sample

Quality Indicator Report—2nd Quarter, 1990

Patient days
Number of inpatient days

	1st	2nd	3rd	4th	Yr.-to-Date	Comp. Group	Comments
1989	11,610	11,520	11,390	10,980	45,500	NA	*Number of inpatient days declining due to shorter lengths of stay and increase in ambulatory care.*
1990	10,950	10,890			21,840	NA	

Hospital-acquired infections
Infections that develop 72 or more hours after admission, per 1,000 patient days

	1st	2nd	3rd	4th	Yr.-to-Date	Comp. Group	Comments
1989	3.5%	2.1%	4.5%	1.1%	2.8%	3.1%	*Fluctuations in rates due to inconsistent data collection methods. Inservice 3/90; will continue to monitor.*
1990	6.2%	3.1%			4.7%	3.1%	

Surgical wound infections
Hospital-acquired infections that develop after inpatient surgery, as a percent of surgical procedures

	1st	2nd	3rd	4th	Yr.-to-Date	Comp. Group	Comments
1989	1.5%	1.8%	4.6%	3.3%	2.8%	0.7%	*Rate significantly higher than comparison group. Infection Control (IC) practitioner to visit hospitals of similar size and case mix for comparison. Report and recommendations due 10/1/90.*
1990	1.9%	2.0%			2.0%	0.6%	

Mortality rates
Deaths as a percentage of discharges, divided after peer review into expected and unexpected

		1st	2nd	3rd	4th	Yr.-to-Date	Comp. Group	Comments
Expected	1989	3.2%	3.1%	3.5%	3.0%	3.2%	3.4%	*Rate remains near norm. Will continue to monitor.*
	1990	2.7%	3.2%			3.0%	3.3%	
Unexpected	1989	0.2%	0.3%	0.3%	0.2%	0.3%	–	*No significant variations in rates for 7 quarters. Will continue to monitor.*
	1990	0.2%	0.3%			0.3%	–	

Transfusion reactions and complications
Reactions and complications as a percent of patients transfused

	1st	2nd	3rd	4th	Yr.-to-Date	Comp. Group	Comments
1989	0.0%	0.2%	0.5%	0.0%	0.2%	–	*Transfusion Committee found 1989 rates were under-reported. New lab manager hired; staff have been monitoring reactions differently. Will continue using their method.*
1990	1.0%	1.1%			1.0%	–	

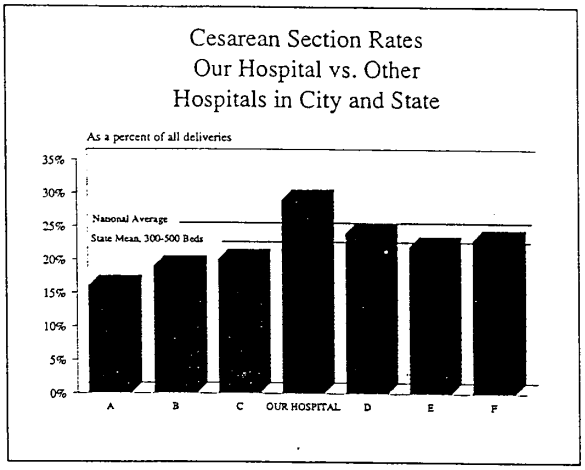
Cesarean section rate
Number of surgical, abdominal deliveries as a percent of total deliveries

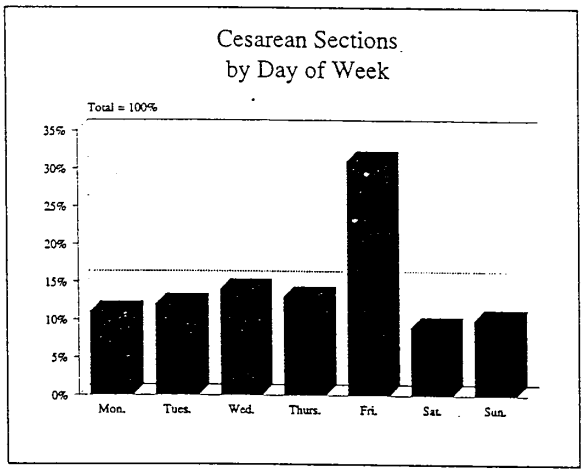
	1st	2nd	3rd	4th	Yr.-to-Date	Comp. Group	Comments
1989	28.5%	28.7%	29.3%	30.1%	29.2%	24.3%	*Rate significantly higher than state and national average. Wide variability among MDs. Dept. Chair to meet and share data with outlier MDs. Dept. will continue to monitor closely.*
1990	31.2%	26.5%			28.9%	23.9%	

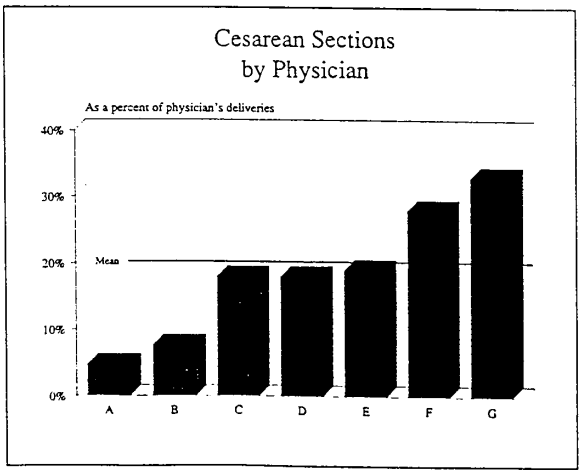
Left AMA/Emergency Department
Number of patients leaving emergency department against medical advice or before seeing a physician

	1st	2nd	3rd	4th	Yr.-to-Date	Comp. Group	Comments
1989	3.2%	4.0%	3.0%	3.1%	3.3%	1.0%	*1/90, Dept. began 7-step plan to reduce AMA rate. Rate currently declining. Will continue to monitor.*
1990	2.4%	0.5%			1.4%	1.0%	

THE QUALITY LETTER wishes to thank Christa Jackson, Manager, Clinical Data Systems, Daughters of Charity National Health System, St. Louis, MO, for her help in preparing this report.


Cesarean Section Rates
Our Hospital vs. Other
Hospitals in City and State
As a percent of all deliveries
35%
30%
25%
20%
15%
10%
5%
0%
National Average
State Mean, 300-500 Beds
A
B
C
OUR HOSPITAL
D
E
F


Cesarean Sections
by Day of Week
Total = 100%
35%
30%
25%
20%
15%
10%
5%
0%
Mon.
Tues.
Wed.
Thurs.
Fri.
Sat.
Sun.


Cesarean Sections
by Physician
As a percent of physician's deliveries
40%
30%
20%
10%
0%
Mean
A
B
C
D
E
F
G

sample report, rates vary from 1.1% to 6.2%. This variation is so large that it may indicate a lack of consistency in data collection from quarter to quarter.

5. *"Too good to be true?"* Is any indicator so good that one might ask, "Are these results too good to be true? Are we measuring or counting this indicator correctly?" For example, the numbers that appear under "Transfusion Reactions and Complications" seem "too good to be true." No reactions or complications at all were recorded in two quarters of 1989. As the explanation indicates, a new laboratory manager discovered significant undercounting of adverse reactions and has revised the data collection system.
6. *Problems and opportunities.* Do the indicators suggest any problems meriting further inquiry or corrective action? Are there opportunities for improvement suggested by the data? For example, the C-section rates are above the national average for similar-sized hospitals. The charts on page 4 show additional data: the hospital's rates are also above the rates of other local hospitals and above the state average for 300–500 bed hospitals; a high percent of C-sections are done on Fridays; and wide variability exists among physicians. One possible explanation for the high C-section rate on Fridays may be an attempt on the part of certain obstetricians to complete deliveries on Fridays in order to keep their weekends free. Another explanation may be a lack of physician consensus on the clinical indications for C-sections. These data indicate a need for further study by the Obstetrics Department and follow-up reports to the Board.
7. *Denominators.* If counts are used instead of percents, they should be reviewed in the context of a pertinent denominator. For example, if a *count* of patients leaving the Emergency Department was used on the sample form, instead of a *rate*, data showing the total number of ER visits should also appear.
8. *Peer review.* What role does peer review play regarding these indicators? For example, who determines whether deaths are expected or unexpected? What happens if peer review determines a death was unexpected and could have been prevented? Is there follow-up and education? Are data on preventable deaths and other occurrences trended by practitioner and considered in the reappointment process?
9. *Frequency of reporting.* How often does the Board (or Board Quality Committee) need to review this report: monthly, quarterly, or annually?
10. *Board action.* What should the Board (or Board Quality Committee) do after reviewing this report? Do the indicators suggest the need for action or closer monitoring with regard to any indicator? For example, the Board may ask, "Is this rate (*eg*, 4%) good enough? Are there opportunities to improve our performance to 3.5% or 3%?"

Summary of Quality Management Activities

"The report should help the Board to see that the quality management program is in place and working effectively."

Report Components

This report summarizes the most significant problem or issue addressed by each of the hospital's major quality management activities.

- The report should help the Board to see that the quality management program is in place and working effectively by documenting problem resolution and quality improvements.
- The report adds a narrative component to the statistical information on quality presented in the previous report.
- Sample completed reports are shown below.

Questions the Board Should Ask

1. *Comprehensiveness.* Does the report list all major clinical and ancillary departments in which quality management is mandated by the Joint Commission or by other accreditation/regulatory bodies? Are any departments not reporting on their activities, and if so, why?
2. *Significance.* Are the problems and issues seemingly minor, or do they reflect significant aspects of patient care and patient services?
3. *Resolution.* For problems, is there documentation of resolution or a corrective action in process? Are further reports to the Board necessary?
4. *Opportunities to improve.* Are there opportunities to improve? Are these being undertaken? Will further reports be made to the Board?
5. *Linkage with statistical indicators.* Is there a relationship between the quality management activities reported here and the statistical indicators reported to the Board? For example, if Cesarean section rates are rising, is this being reviewed by the OB/GYN department?

	Quarterly Report to QAC	Most Significant Problem	Summary of Findings	Resolved, Improved, or Still in Process/Date Action Due
Clinical Departments				
OB/GYN	Y	*Increasing C-section wound infection rate*	*Construction near post partum unit may be contributing factor.*	*Unit moved temporarily on 9/18 to 3 West. Infections will continue to be monitored.*
Radiology	N	*No report.*	*3rd qtr. in a row no report filed.*	*Medical Staff Pres. asked Dept. Chair to make formal report at next MEC meeting.*
Monitoring Functions				
Infection control	Y	*Outbreak of S. aureus.*	*Infection control identified outbreak; investigating 2 possible sources. Regular stats not collected during outbreak period.*	*Staffing issues raised. IC Committee to develop provisions for continuing regular data collection during outbreaks.*
Ancillary and Administrative Depts. and Services				
Special care units	Y	*Type I JCAHO recommendation — lack of physician monitoring and evaluation (M&E).*	*All M&E currently only nursing-related.*	*Surg. to provide training — Swan-Ganz catheter insertion; Surg. and QA to link training to indicator development for non-tissue surgical case review. Status report due Oct. 1990.*

Sample

Quality Management Activities —2nd Quarter, 1990

Clinical Departments	Quarterly Report to QAC[1]	Most Significant Problem	Summary of Findings	Resolved, Improved, or Still in Process/Date Action Due
Anesthesiology				
Emergency				
Medicine				
OB/GYN				
Orthopedics				
Pathology				
Pediatrics				
Radiology				
Surgery				
Monitoring Functions				
Blood use/ Transfusion review				
Infection control				
Medical record review				
Pharmacy, therapeutics, and drug use				
Surgical case review				
Utilization and appropriateness review				
Ancillary and Administrative Depts. and Services				
Ambulatory services				
Dietary				
Emergency services				
Home care				
Nursing				
Pharmacy services				
Radiology services				
Rehabilitation services				
Respiratory services				
Social services				
Special care units				

[1] A "Y" means the Quality Assurance Committee has reviewed and accepted the quarterly report.
An "N" means no report was submitted or the report was rejected.

THE QUALITY LETTER wishes to thank Christa Jackson, Manager, Clinical Data Systems, Daughters of Charity National Health System, St. Louis, MO, for her help in preparing this report.

Summary of Physician Credentialing Activities

Report Components

This report summarizes the results of the physician credentialing process over the last two years. During this time, 58 physicians applied to join the staff and 196 were reviewed for reappointment and renewal of privileges.

- The report provides a perspective on the overall credentialing process to supplement the information provided on individual credentials matters.
- Sample formats for review of *individual* recommendations for initial appointment and reappointment may be found in THE QUALITY LETTER, November 1989 and December 1989/January 1990 issues, respectively.

Questions the Board Should Ask

1. *Applicant volume.* Is there a sufficient number of new applicants in each clinical specialty to meet the needs of the hospital and the community? If not, why not? Are there too few applicants because of community factors (*eg*, socioeconomic status, climate, housing), hospital factors (*eg*, location, equipment, image), or physician factors (*eg*, hostile attitude toward newcomers, lack of backup coverage)? Conversely, is there an oversupply of physicians in any specialty? Should the hospital have a medical staff development plan to target recruitment of needed specialties or closing of sufficiently staffed departments?
2. *Percent Accepted.* Do these figures raise any concerns? Is virtually every applicant accepted, suggesting initial appointment is a rubber stamp? Conversely, are many applicants rejected, raising questions of possible antitrust (see Orthopedics and Surgery in the sample report)? Does any department have a ratio that differs markedly from most other departments? If so, why? Could a department be misusing the credentialing process for anticompetitive purposes?
3. *Abuse of temporary privileges.* How often are temporary privileges granted? Has all background information about an applicant been verified before temporary privileges are granted? Are temporary privileges being used appropriately — *ie*, as a short-term measure in extraordinary circumstances — or inappropriately — to circumvent a thorough credentialing process? For example, notice that the Department of Surgery granted temporary privileges to seven physicians before their appointments were ready to go to the Board for approval.
4. *Advancement from provisional staff.* Is advancement from the provisional staff to full staff status a rubber stamp, or is it based on documentation of sufficient activity to demonstrate clinical and behavioral competence? Are there any data to suggest promotion from the provisional staff is sometimes denied inappropriately?
5. *Rigor of reappointments.* Does the reappointment process appear to be a rubber stamp, or do some reappointments result in curtailment of privileges and other adverse actions, or a recommendation for education or counseling by the department chairman?
6. *Net gain/loss.* Are we gaining or losing physicians in any specialty? The Board may want to review these data along with additional data profiling the medical staff, *eg*, numbers of staff in each specialty by category (active, associate, consulting, courtesy, probationary),

"The report provides a perspective on the overall credentialing process to supplement the information provided on individual credentials matters."

Sample

Physician Credentialing Activities—Jan. 1, 1988-Dec. 31, 1989

Clinical Depts.	Initial Appointments						Reappointments				Totals	
	Number of Applicants	Percent Accepted	Temporary Privileges **	Advanced/ Extended/Dropped After Provisional Period A	E	D	Routine Reappointments	Not Reappointed	Education, Counseling, or Modified Privileges	Resigned/ Moved/ Other	Number of Members Dec. 1989	Net Gain/Loss in Period
Anesthesiology*	2	100%	0	2	0	0	8	0	1	0	11	2
Emergency*	2	100%	1	2	0	0	8	0	0	1	10	1
Medicine	20	90%	2	16	1	1	67	2	2	8	87	8
OB/GYN	3	100%	1	2	0	1	14	1	0	0	17	2
Orthopedics	5	20%	1	1	0	0	16	0	0	1	17	0
Pediatrics	5	100%	0	3	2	0	9	0	1	2	15	3
Pathology*	1	100%	0	1	0	0	2	0	0	1	3	0
Radiology*	2	100%	0	2	0	0	3	0	1	1	5	(1)
Surgery	18	50%	7	5	3	1	59	2	0	2	68	5
TOTAL	**58**	**84%**	**12**	**34**	**6**	**3**	**186**	**5**	**5**	**16**	**233**	**20**

*Contract departments; these departments are closed and only accept applications when there are openings.

**The numbers indicate the number of accepted applicants who received temporary privileges prior to final Board approval.

Accreditation and External Agency Report

"An accreditation report is to quality what the auditor's report is to finance — an independent assessment that the Board should review with care and act upon appropriately."

Report Components

This report summarizes the status of accreditation activities and other reviews by outside agencies. An accreditation report is to quality what the auditor's report is to finance — an independent assessment that the Board should review with care and act upon appropriately.

- The report also makes the Board aware of efforts designed to correct deficiencies identified in accreditation surveys.

Questions the Board Should Ask

1. *Best score.* Is our current accreditation status the highest available? For example, the Joint Commission has a three-year accreditation "with commendation" category. Did we achieve this? Even if we did, are there individual areas in which our performance could improve? For example, the sample hospital was cited for two Type I recommendations during the last survey — for surgical case review, and monitoring and evaluation in special care units. Type I recommendations represent serious performance deficiencies that need to be corrected before the next Joint Commission review. According to the sample report, the Joint Commission will conduct a focused review in six months. What corrective actions are being taken to ensure that the hospital scores higher during the next review? Are these actions being tracked on other Board reports, such as the report summarizing Quality Management Activities (see page 6)?
2. *Other agencies.* Many Boards focus only on the Joint Commission, but other outside agencies also review quality from different perspectives. In the sample report, the PRO Quality Review identified a problem with the inappropriate selection of patients for laparoscopic cholecystectomy. Is the medical staff taking steps to investigate and correct this problem, *eg*, developing clinical indicators for this procedure?
3. *Mock survey.* Will we be conducting a mock survey to prepare for upcoming inspections? When? Will the Board be informed of mock survey results?
4. *Board's role.* What are the requirements for Board performance with regard to accreditation? For example, the Joint Commission *Accreditation Manual for Hospitals* requires the Governing Board to:
   - Specify in the bylaws, or rules and regulations, who in the organization is responsible for quality of care, QA, and credentialing;
   - Receive information on the quality of care and on activities to identify and resolve problems, and improve care;
   - Provide "resources and support systems for the quality assurance functions and risk management functions related to patient care and safety"; and
   - Act on recommendations for medical staff appointments and privileges.

   How well is the Board doing in its specific areas of responsibility?

Sample

Accreditation and External Agency Report

Date of Report: September 1, 1990

Agency/Reviewer	Current Accreditation Status	Next Survey/Report
Joint Commission on Accreditation of Health-care Organizations	*Accredited; two Type I recommendations — surgical case review, monitoring and evaluation in special care units*	*Focused review — Spring 1991; next survey — 1993*
State Health Department	*Accredited*	*1992*
American College of Surgeons Cancer Program	*Approved*	*1993*
College of American Pathologists	*Accredited*	*1991*
National League for Nursing Community Health Accreditation Program	*Accredited*	*1991*
PRO Quality Review	*2nd Qtr. 1990 report identified inappropriate selection of patients for laparoscopic cholecystectomy*	*November 1990*
HCFA Survey Validation Results	*No significant variations found between HCFA's 1988 mortality report and hospital's data*	*December 1990*

THE QUALITY LETTER wishes to thank Christa Jackson, Manager, Clinical Data Systems, Daughters of Charity National Health System, St. Louis, MO, for her help in preparing this report.

Patient Satisfaction Report

"Patient satisfaction indicators provide a measure of how patients perceive the quality of hospital care and services."

Report Components

This report shows selected indicators of patient satisfaction. The data are taken from a carefully designed and validated survey of patients after discharge. Patient satisfaction indicators provide a measure of how patients perceive the quality of hospital care and services.

- The report summarizes patients' perceptions of eight aspects of hospital services, from admissions through discharge and billing.
- The results of two specific items on patient questionnaires — "Would you recommend the hospital to others?" and "Would you return to the hospital again?" — are included.
- Comparative data are provided from other hospitals using the same questionnaire (see THE QUALITY LETTER, "Quality of Care and Patient Satisfaction," February 1990).
- Hospital scores are trended to show changes over time.

Questions the Board Should Ask

1. *Positive trends.* Are we improving overall or in specific areas? Is appropriate recognition and reinforcement being given to the best-performing departments and services?
2. *Problem trends.* Are we getting worse in any areas? If so, what are we doing about it?
3. *Opportunities for improvement.* Which areas pertain to the lowest satisfaction scores? Are our scores significantly lower than the scores of comparable hospitals? What are the reasons for this? What are we doing about it?
4. *Marketing opportunities.* Are we exceptional in any areas? Can we capitalize on these strengths in our marketing program?
5. *Additional data.* Are additional, more specific data being collected on patient satisfaction? Does the Board need to receive any of these data for selected indicators? For example, if nursing satisfaction scores are decreasing, should the Board see a breakdown by:
   - Category — for example, nursing friendliness, promptness, patient education, and technical skills;
   - Unit — for example, medical/surgical, obstetrics, psychiatry, etc.;
   - Shift — for example, days, evenings, nights, weekends.
6. *Community data.* Do we also collect data on the attitudes of community members toward our hospital and other hospitals? How are these data used?

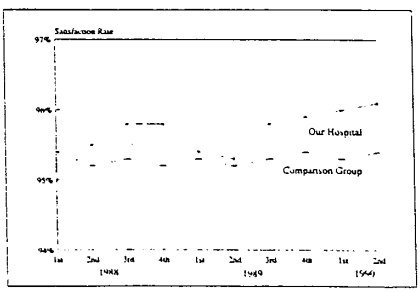
Sample

Patient Satisfaction Report* — 2nd Quarter, 1990

	1988	1989	1990 to Date	Comparison Group	Comments (when necessary)
Admissions process	84%	80%	81%	93%	*Patient dissatisfaction with lengthy admissions process. Cause: delays in patient transport due to staffing problems. Mgr., Admissions, working with Dir., Volunteer Svc., for additional support.*
Room/ Accommodations	97%	97%	96%	94%	
Diet and meals	90%	91%	92%	93%	
Nursing	97%	98%	99%	96%	*Sixth quarterly increase. Highest ratings — 2 East, 3 West. Three RNs honored with employee service awards.*
Physicians	95%	97%	97%	96%	
Tests and treatments	96%	97%	96%	95%	
Discharge process	90%	89%	91%	97%	*Indicator remains below norm. Social Services to investigate; plan of action to QAC 10/15.*
Billing	93%	94%	94%	94%	
Recommend hospital to others?	98%	98%	98%	97%	
Return again to hospital?	96%	96%	97%	96%	

*Scores reflect total "Excellent," "Very Good," and "Good" responses on patient satisfaction surveys.

Overall Patient Satisfaction 1988–1990



Clinical Risk Management Activities

"The report shows selected indicators that provide an overview of the frequency, severity, and status of potentially compensable events affecting the hospital."

Report Components

This report summarizes clinical risk management activities. It does not address nonclinical aspects, such as loss financing or workers compensation, which should also be reported to the Board.

- The report shows selected indicators that provide an overview of the frequency, severity, and status of potentially compensable events affecting the hospital, as well as a summary of claims filed against the organization and their current status. Part of a sample, completed report is shown below.
- Data from the four most recent six-month periods are provided for trend analysis.

Questions the Board Should Ask

1. *Choice of indicators.* Do these indicators represent significant liability perils facing the hospital? Have indicators been identified for high-risk areas, such as Obstetrics, Emergency Medicine, and Intensive Care? *Note:* The Joint Commission recommends in its scoring guidelines that risk management indicators be identified hospital-wide and for *at least three* high-risk clinical areas. To keep the sample report to one page, only one high-risk area — Obstetrics — is shown.
2. *Medical staff involvement.* Are physicians involved in risk management activities, as required by the Joint Commission? Do they assist in defining clinical risk indicators and reviewing adverse occurrences involving medical care?
3. *QA/RM interface.* Are quality assurance and risk management integrated, as required by the Joint Commission? For example, is Quality Assurance notified of all claims brought against the hospital? Does the QA program follow up? Is there evidence that actions have been taken to reduce the potential for similar claims in the future?
4. *Fluctuations and explanations.* Are patterns developing that warrant more extensive loss control activities?
5. *"No surprises."* Have any claims been filed against the hospital that were not identified through the hospital's risk management program? If so, is there a reasonable explanation, or do the data indicate a problem?

Severity Codes

0–no disability	3–major temporary
1–minor temporary	4–major permanent
2–minor permanent	5–death

Area/Indicators	Number of Incidents Jul-Dec 1988	Jan-Jun 1989	Jul-Dec 1989	Jan-Jun 1990	Severity of Incidents 0	1	2	3	4	5	Status/Actions/ Follow-up
Hospitalwide											
Patient falls	257	249	236	217	73%	26%	0	1%	0	0	
Medication errors	146	156	136	126	68%	12%	0	19%	0	1%	*3 deaths caused by unknown medication allergies.*
Transfusion reactions/ errors	90	93	84	76	18%	66%	0	15%	0	1%	*1 death. MD counselled on need for whole blood transfusion; QA will continue to monitor MD.*
Informed consent issues	66	69	63	48	81%	17%	0	2%	0	0	
Discharges AMA	231	220	227	204	56%	43%	0	0	.3%	.7%	*5 deaths reviewed: 1-Emergency Dept.; 3-Psychiatric; 1-Addiction Treatment. All deaths unpreventable. Emergency Dept.'s plan to reduce AMA rate has been effective.*

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for Healthcare Leaders

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Sample

Clinical Risk Management Activities

Severity Codes
0–no disability
1–minor temporary
2–minor permanent
3–major temporary
4–major permanent
5–death

Area/Indicators	Number of Incidents Jul-Dec 1988	Jan-Jun 1989	Jul-Dec 1989	Jan-Jun 1990	Severity of Incidents 0	1	2	3	4	5	Status/Actions/ Follow-up
Hospitalwide											
Patient falls											
Medication errors											
Transfusion reactions/errors											
Informed consent issues											
Discharges AMA											
Surgical complications											
ER issues (coverage, transfer)											
Unexpected death											
Exposure to AIDS/hepatitis											
Equipment failure											
High-Risk Area: Obstetrics											
Unattended delivery											
Apgar < 4 at 5 min.											
Transfers to other facilities											
Neonatal mortality											
Maternal mortality											
Neonatal disability											
Patient/family complaints											

Claims and Litigation Summary (w/severity index)	Number Jul-Dec 1988	Jan-Jun 1989	Jul-Dec 1989	Jan-Jun 1990	Reserves Claim/Case Reserve	Legal/Defense Expenses	Payouts a) settlements b) claims expenses	Case Severity	Total-to-Date
Pending claims									
Pending suits									
Closed claims									
Closed suits									
New claims									
New suits									
Potential claims									

Major Open Claims and Litigation: Summary and Status Case Number/Name and Summary (including settlement efforts, if any)	Date Opened	Was event reviewed at time it happened by RM or QA dept.?	Current Status

THE QUALITY LETTER wishes to thank Fred Bockstahler, Vice President and General Counsel, All Saints Health Care, Inc., Ft. Worth, TX, for his help in preparing this report.

"The green dots are patient satisfaction, the blue dots are infection rates, and the brown dots are where I spilled coffee on the reports."

Three New Editorial Advisory Board Members

This month, THE QUALITY LETTER welcomes three new members to the Editorial Advisory Board: Samuel A. Friede, FACHE, senior administrator at Pittsburgh's Shadyside Hospital; David N. Sundwall, MD, medical director for the public policy arm of American Healthcare Systems, the largest nationwide alliance of not-for-profit multihospital systems; and John M. Wetjen, who directs total quality management activities for northern Virginia-based Inova Health Systems. THE QUALITY LETTER also expresses its appreciation to departing Board member Robert W. O'Leary, President and CEO of Voluntary Hospitals of America, for his support and encouragement in our first year.

Coming in the next issue of THE QUALITY LETTER...

Planning and Budgeting for Total Quality Management

- Timing and strategies for involving physicians in organizationwide total quality management (TQM) activities.
- Memorial Hospital of South Bend's multistep implementation program for TQM, by President and CEO Philip A. Newbold.
- Questions that Boards should consider when budgeting for TQM and measuring its accomplishments, by Craig A. Anderson and Robin D. Daigh of Ernst & Young.

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Bader & Associates, Inc., PO Box 2106, Rockville, MD 20847-2106, 301/468-1610.

ISSN 1047-5311

Appendix J

This appendix contains an example of the Joint Commission on the Accreditation of Healthcare Organisations (JCAHO) accreditation standards for a single department - emergency services.

EMERGENCY SERVICES (ER)

STANDARD

Circle One

ER.1 Emergency medical evaluation or initial treatment is properly assessed by qualified individuals, and appropriate services are provided through a well-defined plan, based on community need and the defined capability of the hospital.* 1 2 3 4 5 NA

REQUIRED CHARACTERISTICS

ER.1.1 The hospital and its medical staff promote, help to develop, and implement a community-based emergency plan. 1 2 3 4 5 NA

ER.1.1.1 Whenever feasible, all hospitals that offer emergency medical services in a community participate in community planning for emergency services.

ER.1.1.2 The hospital evaluates and classifies itself to indicate its capability in providing emergency medical services to the community served. 1 2 3 4 5 NA

ER.1.1.2.1 Classification is based on the overall capability of the hospital and its medical staff to meet the needs of the community. 1 2 3 4 5 NA

ER.1.2 The hospital has a procedure whereby all ill or injured individuals who come to the hospital for emergency medical evaluation or initial treatment are assessed by qualified individuals and, as indicated, either treated or referred to an appropriate organization.* 1 2 3 4 5 NA

ER.1.3 A hospital's emergency department/service is classified according to the levels of the services provided. 1 2 3 4 5 NA

ER.1.3.1 Regardless of the nomenclature assigned, the levels of emergency services range from a comprehensive to a first aid/referral level of care. 1 2 3 4 5 NA

**The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.*

Circle One

ER.1.3.2 The requisite staffing, facilities, and services are provided as delineated in this chapter of this *Manual.* 1 2 3 4 5 NA

ER.1.4 Specific and general requirements are established for four levels of emergency services. Other comparable classifications, such as state or regional, are acceptable, and the hospital is evaluated for compliance at the appropriate level.

ER.1.4.1 A Level I emergency department/service offers comprehensive emergency care 24 hours a day, with at least one physician experienced in emergency care on duty in the emergency care area.* 1 2 3 4 5 NA

ER.1.4.1.1 There is in-hospital physician coverage by members of the medical staff or by senior-level residents for at least medical, surgical, orthopedic, obstetric/gynecologic, pediatric, and anesthesia services.* 1 2 3 4 5 NA

ER.1.4.1.1.1 When such coverage can be demonstrated to be met suitably through another mechanism, an equivalency is considered to exist for purposes of compliance with the requirement.

ER.1.4.1.2 Other specialty consultation is available within approximately 30 minutes; initial consultation through two-way voice communication is acceptable.* 1 2 3 4 5 NA

ER.1.4.1.3 The hospital's scope of services includes in-house capabilities for managing physical and related emotional problems on a definitive basis. 1 2 3 4 5 NA

ER.1.4.1.4 Required Characteristics ER.1.4.1.1 through ER.1.4.1.3 also apply to a comprehensive-level emergency department/service provided by a hospital offering care only to a limited group of patients, such as pediatric, obstetric, ophthalmologic, and orthopedic.

ER.1.4.2 A Level II emergency department/service offers emergency care 24 hours a day, with at least one physician experienced in emergency care on duty in the emergency care area, and with specialty consultation available within approximately 30 minutes by members of the medical staff or by senior-level residents.* 1 2 3 4 5 NA

ER.1.4.2.1 Initial consultation through two-way voice communication is acceptable.

ER.1.4.2.2 The hospital's scope of services includes in-house capabilities for managing physical and related emotional problems, with provision for patient transfer to another organization when needed. 1 2 3 4 5 NA

ER.1.4.3 A Level III emergency department/service offers emergency care 24 hours a day, with at least one physician available to the emergency care area within approximately 30 minutes through a medical staff call roster.* 1 2 3 4 5 NA

ER.1.4.3.1 Initial consultation through two-way voice communication is acceptable.

**The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.*

Circle One

ER.1.4.3.2 Specialty consultation is available by request of the attending medical staff member or by transfer to a designated hospital where definitive care can be provided.* 1 2 3 4 5 NA

ER.1.4.4 A Level IV emergency service offers reasonable care in determining whether an emergency exists, renders lifesaving first aid, and makes appropriate referral to the nearest organizations that are capable of providing needed services.* 1 2 3 4 5 NA

ER.1.4.4.1 The mechanism for providing physician coverage at all times is defined by the medical staff.* 1 2 3 4 5 NA

ER.1.5 Hospitals that offer critical therapeutic services in such specialized clinical areas as spinal cord injury, burns, trauma, and so forth are considered as providing comprehensive (Level I) services for the specific clinical focus of care, while the emergency services otherwise provided are evaluated at the appropriate level.

ER.1.6 Patients are transferred in accordance with the community-based hospital emergency plan. 1 2 3 4 5 NA

ER.1.6.1 A hospital is capable of instituting essential lifesaving measures and implementing emergency procedures that will minimize further compromise of the condition of any infant, child, or adult being transported.* 1 2 3 4 5 NA

ER.1.6.2 Unless extenuating circumstances are documented in the patient's record, no patient is arbitrarily transferred to another hospital if the hospital where he is initially seen has the means for providing adequate care.* 1 2 3 4 5 NA

ER.1.6.2.1 The patient is not transferred until the receiving organization has consented to accept the patient and the patient is considered sufficiently stabilized for transport.* 1 2 3 4 5 NA

ER.1.6.2.2 Responsibility for the patient during transfer is established, and all pertinent medical information accompanies the patient being transferred.* 1 2 3 4 5 NA

ER.1.7 When the hospital provides emergency services to the public, the location of the emergency access area is identified by clearly visible signs. 1 2 3 4 5 NA

ER.1.8 The role of the emergency department/service in the hospital's internal and external disaster plans is consistent with the capabilities of the hospital and community served. 1 2 3 4 5 NA

ER.1.8.1 For requirements of the hospital's disaster plans, refer to the "Plant, Technology, and Safety Management" chapter of this *Manual*.

ER.1.9 There is a communication system, such as radio-telephone or other appropriate means, that permits instant contact with law enforcement agencies, rescue squads, and other emergency services within the community to provide advance information concerning critically ill or injured patients. 1 2 3 4 5 NA

**The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.*

Circle One

ER.1.9.1 When required frequently in the emergency care area, there is a means of communicating in the language of the predominant population groups served by the hospital's emergency department/service. 1 2 3 4 5 NA

STANDARD

ER.2 The emergency department/service is well organized, properly directed, and staffed according to the nature and extent of health care needs anticipated and the scope of services offered.* 1 2 3 4 5 NA

REQUIRED CHARACTERISTICS

ER.2.1 The relationship of the emergency department/service to other units and departments/services of the hospital is specified in the overall hospital organizational plan. 1 2 3 4 5 NA

ER.2.2 The responsibility and accountability of the emergency department/service to the medical staff and hospital administration is defined in writing. 1 2 3 4 5 NA

ER.2.3 The emergency department/service is directed by a physician member of the medical staff.* 1 2 3 4 5 NA

ER.2.3.1 A deputy director or other qualified physician member of the medical staff is designated and authorized to perform the function of the director when he is unavailable. 1 2 3 4 5 NA

ER.2.3.2 The director, the deputy director, or other qualified physician in charge of a Level I or Level II emergency department/service has at least three years of training and/or experience in a specialty appropriate (as determined by the medical staff) to the care and treatment of emergency patients.* 1 2 3 4 5 NA

ER.2.3.3 The director has the authority and responsibility for implementing established policies and for providing overall direction in the continuing operation of the department/service. 1 2 3 4 5 NA

ER.2.3.4 The director assures that the quality, safety, and appropriateness of emergency patient care are monitored and evaluated and that appropriate actions based on findings are taken.* 1 2 3 4 5 NA

ER.2.3.5 The credentials files of the director, deputy director, and all other practitioners with emergency department/service privileges reflect their training and experience, as well as evidence of current competence.* 1 2 3 4 5 NA

ER.2.3.6 The director of a Level I emergency department/service or his deputy or qualified physician designee is readily available.* 1 2 3 4 5 NA

The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.

Circle One

ER.2.3.7 Except under unusual circumstances, the position of the director is held on a full-time basis. 1 2 3 4 5 NA

ER.2.3.8 Direction of a Level III emergency department/service may be provided by a physician member of the medical staff or by a multidisciplinary medical staff committee, with the chairman of the committee serving as director of the emergency department/service.* 1 2 3 4 5 NA

ER.2.4 The method of providing medical staff coverage is defined.* 1 2 3 4 5 NA

ER.2.4.1 Acceptable methods include the use of house staff under adequate medical staff supervision; the use of contract groups whose members must be members of the medical staff, unless otherwise provided by law; or assumption of such coverage by medical staff members.

ER.2.4.1.1 When the medical staff has assumed the responsibility, its members have an obligation for emergency room coverage as determined by the medical staff, each in accordance with his clinical competence and privileges.* 1 2 3 4 5 NA

ER.2.4.1.2 Specialists in limited practice are available on an established schedule to provide consultation on the needs of emergency patients or to provide special services to emergency patients.* 1 2 3 4 5 NA

ER.2.4.1.3 When physicians are employed for only brief periods of time, such as evenings, weekends, or holidays, their professional and personal qualifications are evaluated through the established medical staff credentialing mechanism to assure appropriate licensure, privilege delineation, staff categorization, and approval by the governing body.* 1 2 3 4 5 NA

ER.2.4.1.4 For medical staff membership requirements, refer to Standard MS.1 of the "Medical Staff" chapter of this *Manual.*

ER.2.4.1.5 A physician is responsible for the degree of evaluation and treatment provided to any patient who presents himself or is brought to the emergency care area.* 1 2 3 4 5 NA

ER.2.4.1.6 The priority with which persons seeking emergency care will be seen by a physician may be determined by specially trained personnel using guidelines established by the emergency department/service director and approved by the medical staff. 1 2 3 4 5 NA

ER.2.4.1.7 Rosters designating medical staff members on duty or on call for primary coverage and specialty consultation are posted in the emergency care area.* 1 2 3 4 5 NA

ER.2.5 A designated registered nurse who is qualified by relevant training, experience, and current competence in emergency care supervises the care provided by all nursing staff members within the emergency department/service.* 1 2 3 4 5 NA

**The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.*

Circle One

ER.2.5.1 Level I and Level II emergency departments/services have at least one registered nurse and a sufficient number of other nursing staff members permanently assigned and on duty within the emergency service area at all times.* 1 2 3 4 5 NA

ER.2.5.2 The number of nursing staff members is sufficient for the types and volume of patients served.* 1 2 3 4 5 NA

ER.2.5.3 A Level III emergency department/service has a registered nurse available on at least an on-call, in-house basis at all times.* 1 2 3 4 5 NA

ER.2.5.4 The registered nurse assigned managerial responsibility for emergency care services participates in committee activities concerned with the emergency department/service.* 1 2 3 4 5 NA

ER.2.6 When emergency medical technicians or other allied health personnel are used, their duties and their responsibilities to physicians and nurses providing care within the emergency service area are defined in writing. 1 2 3 4 5 NA

ER.2.6.1 Other staff disciplines are available as required. 1 2 3 4 5 NA

STANDARD

ER.3 The emergency department/service is appropriately integrated with other units and departments/services of the hospital.* 1 2 3 4 5 NA

REQUIRED CHARACTERISTICS

ER.3.1 Clinical laboratory services with the capability of performing all routine studies and standard analyses of blood, urine, and other body fluids are readily available at all times to Level I, Level II, and Level III emergency departments/services.* 1 2 3 4 5 NA

ER.3.1.1 Laboratory services supporting Level I and Level II emergency departments/services provide arterial blood gas and pH determinations, coagulation studies, serum and urine osmolality, microbiologic studies, and, as required, toxicologic studies.* 1 2 3 4 5 NA

ER.3.1.2 An adequate supply of blood is available at all times, either in-hospital or from an outside source approved by the medical staff.* 1 2 3 4 5 NA

ER.3.1.3 The hospital provides for blood typing and crossmatching capability and for blood-storage facilities that are readily available to the emergency department/service.* 1 2 3 4 5 NA

ER.3.2 Diagnostic radiology services are readily available at all times to provide routine studies using both fixed and mobile equipment.* 1 2 3 4 5 NA

*The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.

Circle One

ER.3.2.1 For Level I and Level II emergency departments/services, angiography of all types, sonography, and nuclear scanning are readily available, as needed.* 1 2 3 4 5 NA

ER.3.3 Level I emergency departments/services have prompt access, as needed, to operating suites that have the following capabilities: cardiopulmonary bypass pump oxygenator; operating microscope; thermal-control equipment for the patient and for blood; fracture table; roentgenographic equipment, including image intensifier; endoscopes, all varieties; craniotomy equipment; electrocardiograph-oscilloscope-defibrillator; pacemaker-insertion capability; mechanical ventilator; and equipment for monitoring direct blood pressure, temperature, blood-flow rate, and respirations.* 1 2 3 4 5 NA

ER.3.3.1 Appropriate surgical specialists and anesthesiology and operating room personnel are in-house and available within a few minutes.* 1 2 3 4 5 NA

ER.3.4 Level II emergency departments/services have prompt access to operating suites with the following equipment: thermal-control equipment for the patient and for blood, fracture table, appropriate endoscopic equipment, electrocardiograph-oscilloscope-defibrillator, mechanical ventilator, and temperature-monitoring equipment.* 1 2 3 4 5 NA

ER.3.4.1 Roentgenographic equipment is readily available.* 1 2 3 4 5 NA

ER.3.5 Depending on the level of emergency service provided, there is access to the obstetric suite and special care units.* 1 2 3 4 5 NA

STANDARD

ER.4 All personnel are prepared for their emergency care responsibilities through appropriate training and education programs.* 1 2 3 4 5 NA

Required Characteristics

ER.4.1 A planned, formal training program is required for all registered and licensed nurses and for nonphysicians who provide patient care in the emergency department/service. 1 2 3 4 5 NA

ER.4.1.1 When there is no in-house capability for providing such training, a qualified outside source of instruction is substituted. 1 2 3 4 5 NA

ER.4.1.2 The program is acceptable to the physician director of the emergency department/service, or to the committee of the medical staff when there is no director, and to the director of the nursing department/service. 1 2 3 4 5 NA

**The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.*

Circle One

ER.4.1.3 The orientation program is of sufficient duration and substance to cover all patient care responsibilities related to each individual's level of participation in the emergency department/service. 1 2 3 4 5 NA

ER.4.1.4 The program includes training in the following:

ER.4.1.4.1 The recognition, interpretation, and recording of patients' signs and symptoms, particularly those that require notification of a physician; 1 2 3 4 5 NA

ER.4.1.4.2 The initiation of cardiopulmonary resuscitation and other related life-support procedures; 1 2 3 4 5 NA

ER.4.1.4.3 The parenteral administration of electrolytes, fluids, blood, and blood components; 1 2 3 4 5 NA

ER.4.1.4.4 Wound care and the management of sepsis; 1 2 3 4 5 NA

ER.4.1.4.5 Initial burn care; 1 2 3 4 5 NA

ER.4.1.4.6 The initial management of injuries to the extremities and central nervous system; 1 2 3 4 5 NA

ER.4.1.4.7 The effective and safe use of electrical and electronic life-support and other equipment used in the emergency department/service; 1 2 3 4 5 NA

ER.4.1.4.8 The prevention of contamination and cross infection; and 1 2 3 4 5 NA

ER.4.1.4.9 The recognition of and attention to the psychosocial needs of patients and their families. 1 2 3 4 5 NA

ER.4.2 All emergency department/service personnel participate in relevant in-service education programs. 1 2 3 4 5 NA

ER.4.2.1 The director or his qualified designee(s) contributes to the in-service education of emergency department/service personnel. 1 2 3 4 5 NA

ER.4.2.2 In-service education includes the safety and infection control requirements described in this *Manual*. 1 2 3 4 5 NA

ER.4.2.3 Cardiopulmonary resuscitation training is conducted as often as necessary for all physicians, nurses, and nonphysicians who work in the emergency care area. 1 2 3 4 5 NA

ER.4.2.4 The hospital administration assures that there are opportunities for physicians, nurses, and, as required, other personnel to participate in emergency department/service continuing education programs outside the hospital, as needed. 1 2 3 4 5 NA

ER.4.2.5 Education programs for emergency department/service personnel are based, at least in part, on the results of the monitoring and evaluation of the quality and appropriateness of emergency care. 1 2 3 4 5 NA

ER.4.2.6 The extent of participation is documented and is realistically related to the size of the staff and to the scope and complexity of the emergency care services provided. 1 2 3 4 5 NA

**The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.*

Circle One

STANDARD

ER.5 Emergency patient care is guided by written policies and procedures.* 1 2 3 4 5 NA

Required Characteristics

ER.5.1 There are written policies and procedures specifying the scope and conduct of patient care to be provided in the emergency department/service.* 1 2 3 4 5 NA

ER.5.1.1 Such policies and procedures are approved by the medical staff and hospital administration and are reviewed at least annually, revised as necessary, dated to indicate the time of the last review, and enforced.† 1 2 3 4 5 NA

ER.5.1.2 The policies and procedures in Level I, Level II, and Level III emergency departments/services and, as appropriate, in Level IV emergency departments/services relate to at least the following: 1 2 3 4 5 NA

ER.5.1.2.1 The location, storage, and procurement of medications, blood, supplies, and equipment at all times.* 1 2 3 4 5 NA

ER.5.1.2.2 The provision of care to an unemancipated minor not accompanied by a parent or guardian, or to an unaccompanied unconscious patient. 1 2 3 4 5 NA

ER.5.1.2.3 The circumstances under which the patient's personal physician is to be notified or given reports. 1 2 3 4 5 NA

ER.5.1.2.4 The confidentiality of patient information and the safeguarding of records. 1 2 3 4 5 NA

ER.5.1.2.5 The release of authorized information and materials to police or health authorities. 1 2 3 4 5 NA

ER.5.1.2.6 The transfer and discharge of patients.* 1 2 3 4 5 NA

ER.5.1.2.7 The emergency medical record, including any consent for treatment. 1 2 3 4 5 NA

ER.5.1.2.8 Infection control measures, including procedures designed to eliminate the possibility of contamination and cross-infection.* 1 2 3 4 5 NA

ER.5.1.2.9 The procedures to be followed in the event of equipment failure.* 1 2 3 4 5 NA

ER.5.1.2.10 Pertinent safety practices.* 1 2 3 4 5 NA

ER.5.1.2.11 The control of traffic, including visitors. 1 2 3 4 5 NA

**The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.*

†Review of infection control measures (ER.5.1.2.8) may be done every two years in accordance with the new IC.2.4, if deemed appropriate by the emergency department/service. Required Characteristic IC.2.4 became effective for accreditation purposes on January 1, 1990.

Circle One

ER.5.1.2.12 The dispensing of medications in accordance with the requirements of the "Pharmaceutical Services" chapter of this *Manual.*

1 2 3 4 5 NA

ER.5.1.2.13 The handling and safekeeping of patients' valuables.

1 2 3 4 5 NA

ER.5.1.2.14 The role of the emergency department/service in the hospital emergency preparedness program.

1 2 3 4 5 NA

ER.5.1.2.15 Specification of the scope of treatment allowed, including the general and specific procedures that may not be performed by medical staff members in the emergency department/service, and the use of anesthesia.*

1 2 3 4 5 NA

ER.5.1.2.16 Who, other than physicians, may perform special procedures, under what circumstances, and under what degree of supervision.*

1 2 3 4 5 NA

ER.5.1.2.16.1 Such procedures include, but need not be limited to, cardiopulmonary resuscitation, including cardiac defibrillation; endotracheal intubation; tracheostomy or cricothyreotomy; respiratory care, including assisted ventilation and humidification; the administration of parenteral antiarrhythmic and other specified medications; and the obtaining of arterial and venous blood samples and other laboratory specimens.

1 2 3 4 5 NA

ER.5.1.2.17 The use of standing orders.

1 2 3 4 5 NA

ER.5.1.2.18 The property exchange system, when necessitated by the transportation and transfer of patients.

1 2 3 4 5 NA

ER.5.1.2.19 Circumstances that require the patient to return to the emergency department/service for treatment.

1 2 3 4 5 NA

ER.5.1.2.20 The emergency management of individuals who have actual or suspected exposure to radiation or who are radioactively contaminated.

1 2 3 4 5 NA

ER.5.1.2.20.1 Such action may include radioactivity monitoring and measurement; designation and any required preparation of space for evaluation of the patient, including, as required, discontinuation of the air-circulation system to prevent the spread of contamination; decontamination of the patient through an appropriate cleansing mechanism; and containment, labeling, and disposition of contaminated materials.

ER.5.1.2.20.2 The individual responsible for radiation safety should be notified.

1 2 3 4 5 NA

ER.5.1.2.21 The handling of alleged or suspected rape victims or victims of sexual molestation.

1 2 3 4 5 NA

ER.5.1.2.21.1 Criteria for an adequate medicolegal evaluation include examination and treatment; required patient consent; collection, retention, and safeguarding of specimens, photographs, and other evidentiary material released; and, as legally required, notification of and release of information to the proper authorities.

1 2 3 4 5 NA

**The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.*

Circle One

ER.5.1.2.21.2 Examination of and consultation with the patient take place only when visual and auditory privacy are provided. 1 2 3 4 5 NA

ER.5.1.2.22 The handling of alleged or suspected child abuse cases. 1 2 3 4 5 NA

ER.5.1.2.22.1 Criteria for alerting emergency department/service personnel to the possibility of child abuse are developed. 1 2 3 4 5 NA

ER.5.1.2.22.2 Pertinent information may be obtained from the history, physical examination, laboratory and radiologic tests, photographs, and observations of parent/child interactions. 1 2 3 4 5 NA

ER.5.1.2.22.3 The medical record documents the treatment given and any required reporting to the proper authorities. 1 2 3 4 5 NA

ER.5.1.2.23 The management of pediatric emergencies. 1 2 3 4 5 NA

ER.5.1.2.24 The reporting of individuals dead on arrival to the proper authorities. 1 2 3 4 5 NA

ER.5.1.2.25 Any legally required collection and preservation of evidence regarding individuals dead on arrival. 1 2 3 4 5 NA

ER.5.1.2.26 The management of patients who are under the influence of drugs or alcohol or who are emotionally ill or become difficult to manage. 1 2 3 4 5 NA

ER.5.1.2.27 The initial management of patients with burns, hand injuries, head injuries, fractures, multiple injuries, poisoning, animal bites, gunshot or stab wounds, and other acute problems. 1 2 3 4 5 NA

ER.5.1.2.28 Precautions to be taken in preventing the occurrence of accidents to unconscious or irrational patients. 1 2 3 4 5 NA

ER.5.1.2.29 Tetanus and rabies prevention/prophylaxis. 1 2 3 4 5 NA

ER.5.2 Current toxicologic reference materials and antidote information are readily available in the emergency department/service, along with the telephone number of the regional poison control information center. 1 2 3 4 5 NA

ER.5.3 A list of referral and consultation services is prominently displayed and includes, as appropriate, the regional coordinating office for radiologic emergency assistance, antivenin service, county coroner or medical examiner, police department, state and local health departments, ambulance transport and rescue services, tissue donation centers, and special care services not provided by the hospital. 1 2 3 4 5 NA

STANDARD

ER.6 The emergency department/service is designed and equipped to facilitate the safe and effective care of patients.* 1 2 3 4 5 NA

*The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.

Required Characteristics

Circle One

ER.6.1 The hospital is easily accessible from the emergency care area to permit rapid admission of patients initially treated in the emergency department/service. 1 2 3 4 5 NA

ER.6.1.1 The emergency department/service is in proximity to the emergency entrance and on the same level. 1 2 3 4 5 NA

ER.6.1.2 The entrance is clearly identified externally and is accessible to emergency vehicles and pedestrian traffic. 1 2 3 4 5 NA

ER.6.1.2.1 If a separate approach is provided for ambulatory patients, any differences in levels are bridged by a ramp rather than by steps. 1 2 3 4 5 NA

ER.6.1.3 All emergency department/service entrance doors are well lighted and protected from the weather. 1 2 3 4 5 NA

ER.6.1.3.1 Entrance doors are wide enough to accommodate patients, attendants, and equipment. 1 2 3 4 5 NA

ER.6.1.4 Stretchers and wheelchairs are stored immediately adjacent to the emergency department/service entrance but do not obstruct entry. 1 2 3 4 5 NA

ER.6.1.5 A waiting area, telephone, and lavatory are available to patients seeking emergency medical care and to individuals accompanying them. 1 2 3 4 5 NA

ER.6.1.6 Unauthorized individuals are prohibited from entering the treatment and work areas of the emergency department/service. 1 2 3 4 5 NA

ER.6.1.7 The design of the emergency department/service area facilitates the visual and auditory privacy of patients, without compromising patient care. 1 2 3 4 5 NA

ER.6.1.8 Sufficient space is provided for the examination and treatment of patients seeking emergency care, particularly patients with life-threatening conditions.* 1 2 3 4 5 NA

ER.6.2 When observation beds are permitted, there are written policies and procedures that address the type of patient use, the maximum time period of use, the mechanism for providing appropriate surveillance, and the type of nurse/patient system to be used. 1 2 3 4 5 NA

ER.6.3 When warranted by the size and sophistication of the emergency care area, an intercommunication/alarm system is provided between the nurses' station and any examination, treatment, or other areas from which additional personnel may need to be summoned in an emergency. 1 2 3 4 5 NA

ER.6.4 Rapid communication between the emergency care area and other departments/services in the hospital is assured. 1 2 3 4 5 NA

ER.6.5 When indicated, examination rooms, such as rooms for gynecologic, ophthalmologic, orthopedic, or pediatric patients, are provided. 1 2 3 4 5 NA

The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.

Circle One

ER.6.6 When general anesthesia is administered in the emergency service, the anesthesia area meets the requirements of the National Fire Protection Association (NFPA) standards, especially the standards cited in Chapter 12, "Hospital Requirements," in NFPA 99, *Standard for Health Care Facilities*, 1987, and the "Surgical and Anesthesia Services" chapter of this *Manual*.* 1 2 3 4 5 NA

ER.6.7 Protective security may be required in the care of combative or emotionally disturbed patients.

ER.6.8 Equipment and supplies used in the emergency department/service are of the same quality as those used throughout the hospital and are suitable for all sizes of patients treated.* 1 2 3 4 5 NA

ER.6.8.1 Equipment is checked on a scheduled basis in accordance with the hospital preventive maintenance program and the requirements of the "Plant, Technology, and Safety Management" chapter of this *Manual*.* 1 2 3 4 5 NA

ER.6.8.2 At least the following are readily available for use in Level I and Level II emergency departments/services and, as appropriate, in Level III and Level IV emergency departments/services:*

ER.6.8.2.1 Oxygen and the means of administration; 1 2 3 4 5 NA

ER.6.8.2.2 Mechanical ventilatory assistance equipment, including airways, manual breathing bag, and ventilator; 1 2 3 4 5 NA

ER.6.8.2.3 Cardiac defibrillator with synchronization capability; 1 2 3 4 5 NA

ER.6.8.2.4 Respiratory and cardiac monitoring equipment; 1 2 3 4 5 NA

ER.6.8.2.5 Thoracentesis and closed thoracostomy sets; 1 2 3 4 5 NA

ER.6.8.2.6 Tracheostomy set; 1 2 3 4 5 NA

ER.6.8.2.7 Tourniquets; 1 2 3 4 5 NA

ER.6.8.2.8 Vascular cutdown sets; 1 2 3 4 5 NA

ER.6.8.2.9 Laryngoscopes and endotracheal tubes; 1 2 3 4 5 NA

ER.6.8.2.10 Tracheobronchial and gastric suction equipment; 1 2 3 4 5 NA

ER.6.8.2.11 Urinary catheters with closed volume urinary systems; 1 2 3 4 5 NA

ER.6.8.2.12 Pleural and pericardial drainage set; 1 2 3 4 5 NA

ER.6.8.2.13 Minor surgical instruments; 1 2 3 4 5 NA

ER.6.8.2.14 Splinting devices; and 1 2 3 4 5 NA

ER.6.8.2.15 Emergency obstetric pack. 1 2 3 4 5 NA

ER.6.8.3 Standard drugs, antivenin (in geographic areas as indicated), common poison antidotes, syringes and needles, parenteral fluids and infusion sets, plasma substitutes and blood administration sets, and surgical supplies are available for immediate use. 1 2 3 4 5 NA

**The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.*

Circle One

ER.6.8.4 Emergency drug carts or emergency drug storage areas are checked by an appropriate individual at least once per shift and after each use to assure that all items that must be immediately available are actually in the cart and in usable condition. 1 2 3 4 5 NA

ER.6.8.4.1 This requirement may be met by a system designed to assure the continued integrity of the contents between periods of use.

ER.6.8.5 Uniformity in the arrangement of supplies is recommended to facilitate rapid implementation of emergency care. [$s]

ER.6.8.6 There is refrigerated storage for biologicals and all other supplies requiring such storage within the emergency department/service. 1 2 3 4 5 NA

ER.6.8.7 Examination tables are stable, lock, and are adjustable to required positions. 1 2 3 4 5 NA

ER.6.8.7.1 Stretchers and examination tables that can be penetrated by x-rays are recommended.

ER.6.8.7.2 Side rails and safety straps are available. 1 2 3 4 5 NA

STANDARD

ER.7 A medical record is maintained on every patient seeking emergency care and is incorporated into the patient's permanent hospital record.* 1 2 3 4 5 NA

Required Characteristics

ER.7.1 All prior pertinent inpatient and ambulatory care patient medical record documentation, including previous visits to the emergency department/service, are made available, whenever possible, when requested by the attending physician or other authorized individual. 1 2 3 4 5 NA

ER.7.1.1 Each time a patient visits the emergency department/service, the following information is entered in the patient's medical record:*

ER.7.1.1.1 Patient identification. 1 2 3 4 5 NA

ER.7.1.1.1.1 When not obtainable, the reason is entered in the medical record. 1 2 3 4 5 NA

ER.7.1.1.2 Time and means of arrival. 1 2 3 4 5 NA

ER.7.1.1.3 Pertinent history of the illness or injury, and physical findings, including the patient's vital signs.* 1 2 3 4 5 NA

ER.7.1.1.4 Emergency care given to the patient prior to arrival. 1 2 3 4 5 NA

ER.7.1.1.5 Diagnostic and therapeutic orders.* 1 2 3 4 5 NA

The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.

Circle One

ER.7.1.1.6 Clinical observations, including the results of treatment.* 1 2 3 4 5 NA

ER.7.1.1.7 Reports of procedures, tests, and results.* 1 2 3 4 5 NA

ER.7.1.1.8 Diagnostic impression.* 1 2 3 4 5 NA

ER.7.1.1.9 Conclusion at the termination of evaluation/treatment, including final disposition, the patient's condition on discharge or transfer, and any instructions given to the patient and/or family for follow-up care. 1 2 3 4 5 NA

ER.7.1.1.10 A patient's leaving against medical advice. 1 2 3 4 5 NA

ER.7.1.2 The medical record is authenticated by the practitioner who is responsible for its clinical accuracy.* 1 2 3 4 5 NA

ER.7.1.3 It is recommended that the ambulance record of the patient be available to the practitioner who provides emergency care and that it be filed with, but not necessarily as part of, the patient's medical record.

ER.7.2 A control register is continuously maintained and includes at least the following information for every individual seeking care: identification, such as name, age, sex; date, time, and means of arrival; nature of the complaint; disposition; and time of departure. 1 2 3 4 5 NA

ER.7.2.1 The control register adequately identifies all persons seeking emergency care. 1 2 3 4 5 NA

ER.7.2.2 The names of individuals dead on arrival are also entered in the register. 1 2 3 4 5 NA

ER.7.2.3 Information obtained from the register may aid in planning staffing for the emergency department/service and can be used as a guide in selecting records for the evaluation of the quality and appropriateness of services provided.

ER.7.2.3.1 Information obtained from the register may also be used in appropriate institutional planning of health care services based on community need.

STANDARD

ER.8 The emergency department/service establishes appropriate quality control mechanisms.* 1 2 3 4 5 NA

Required Characteristics

ER.8.1 At least the following quality control mechanisms are established:*

**The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.*

Circle One

ER.8.1.1 When authorized, a copy of the record of emergency services provided is available to the private practitioner or medical organization responsible for follow-up care. 1 2 3 4 5 NA

ER.8.1.2 A timely review of x-rays is conducted, and the official interpretation of an x-ray is available to the private practitioner and to the practitioner who provides emergency care. 1 2 3 4 5 NA

ER.8.1.2.1 There is a mechanism for notifying and recalling those patients who require additional radiologic studies or those for whom a more definitive radiologic interpretation has been made. 1 2 3 4 5 NA

ER.8.1.3 Reports of laboratory test results are made available in a timely manner to the private practitioner and to the practitioner who provides emergency care. 1 2 3 4 5 NA

ER.8.1.3.1 There is a mechanism for notifying and recalling patients who require additional or repeat laboratory studies. 1 2 3 4 5 NA

ER.8.1.4 The interpretation of electrocardiograms by physicians with such privileges is available to the private practitioner and to the practitioner providing emergency care. 1 2 3 4 5 NA

ER.8.1.4.1 There is a mechanism for notifying and recalling patients who require additional electrocardiographic studies. 1 2 3 4 5 NA

ER.8.1.5 Patient transfer is carried out safely and in accordance with a written transfer protocol. 1 2 3 4 5 NA

ER.8.1.6 Emergency department/service patients who receive blood transfusions are included in the medical staff's review of blood utilization. 1 2 3 4 5 NA

ER.8.1.7 Emergency department/service patients who receive drugs are included in the medical staff's review of the clinical use of drugs. 1 2 3 4 5 NA

ER.8.1.8 Emergency medical records of the previous 24 hours, when possible, are reviewed daily on at least a representative sample basis by the medical director or his designee to assess the adequacy of the services provided and of the documentation. 1 2 3 4 5 NA

ER.8.1.9 Surgical specimens removed from patients in the emergency care area are sent to the pathologist for examination, except for those specimens that for legal reasons are given directly in the chain of custody to law enforcement representatives. 1 2 3 4 5 NA

STANDARD

ER.9 As part of the hospital's quality assurance program, the quality and appropriateness of patient care provided by the emergency department/service are monitored and evaluated in accordance with Standard QA.3 and Required Characteristics QA.3.1 through QA.3.2.8 in the "Quality Assurance" chapter of this *Manual.** 1 2 3 4 5 NA

**The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.*

Circle One

Required Characteristics

ER.9.1 The physician director of the emergency department/service is responsible for implementing the monitoring and evaluation process.* 1 2 3 4 5 NA

ER.9.1.1 The emergency department/service participates in*

ER.9.1.1.1 the identification of the important aspects of care for the department/service; 1 2 3 4 5 NA

ER.9.1.1.2 the identification of the indicators used to monitor the quality and appropriateness of the important aspects of care; and 1 2 3 4 5 NA

ER.9.1.1.3 the evaluation of the quality and appropriateness of care. 1 2 3 4 5 NA

ER.9.2 When an outside source(s) provides emergency patient care services, or when there is no designated emergency department/service, the medical staff is responsible for implementing the monitoring and evaluation process.* 1 2 3 4 5 NA

**The asterisked items are key factors in the accreditation decision process. For an explanation of the use of the key factors, see "Using the Manual," page ix.*

***Note:** For other requirements related to emergency services, refer to the following chapters of this Manual: "Alcoholism and Other Drug Dependence Services," "Diagnostic Radiology Services," "Infection Control," "Medical Record Services," "Medical Staff," "Nuclear Medicine Services," "Nursing Care," "Pathology and Medical Laboratory Services," "Pharmaceutical Services," "Plant, Technology, and Safety Management," "Quality Assurance," "Radiation Oncology Services," "Social Work Services," and "Surgical and Anesthesia Services."*

The revised standard and required characteristics concerning the monitoring and evaluation process (ER.9 through ER.9.2) became effective for accreditation purposes on July 1, 1989.

The revised required characteristic concerning written policies on the use of observation beds (ER.6.2) becomes effective for accreditation purposes on January 1, 1991.

Notes and Comments:

Appendix K

This appendix contains information on the development of the JCAHO Agenda for Change programme of research.

AGENDA FOR *Change*

Joint Commission

THE JOINT COMMISSION'S AGENDA FOR CHANGE

Stimulating Continual Improvement in the Quality of Care

February 1990

Introduction—The Merging of Public Interests in the Value of Health Care

The 1980s were years of dramatic change in the United States health care delivery system. The institution of major reforms in payment mechanisms for hospitals and physicians and the development of more intense provider competition were dramatic characteristics of the period, but perhaps the most far-reaching change was that the country's long-standing priority for quality care was reshaped by compelling demands for greater efficiency in the delivery of services and for more objective evidence of the effectiveness of care. As a new decade begins, those who pay for and consume health care increasingly are expecting an objective accounting of the results of care. Organizations that are able to demonstrate that they provide care in an effective and efficient manner are likely to be the winners in this new environment.

This striking change in public policy and societal expectations occurred at a time when a major reevaluation was already underway within the Joint Commission. There had been mounting indications that the steady accretion in the volume of standards had resulted in a blurring of the evaluation focus and, indeed, of performance expectations. It was becoming clear as well that the historical concentration on analysis of capability should be supplemented by the monitoring of actual performance. In 1986, this searching review process led to a determination to embark on a multi-year initiative to reshape the nature, though not the fundamental purposes, of accreditation. It was thus agreed that the methods the Joint Commission used to evaluate and monitor health care organizations could and should be improved.

The shift in public policy and the commitment to improve the accreditation process both grew from a widespread belief that health care organizations could provide services more effectively while also serving as more prudent stewards of the enormous investment made by government, business and the public in the health care system. Simply stated, a broad-based consensus had evolved that value—the relationship and balance between quality and cost—must become the new objective in health care.

This consensus is, of course, but a precursor to organizational change. Incorporation of this concept into the day-to-day operation of health care organizations will be the challenge for the 1990s and health care organization leaders will be in the spotlight as they direct, and lead, corporate culture change. This effort will be paralleled by steady and substantial improvement in the methods used to evaluate and improve governance, management and clinical care activities. Those who govern and manage health care organizations have historically devoted their energies to the management, acquisition and deployment of resources. This set of activities has largely been detached from the systematic identification of community needs, and resource allocation has infrequently been guided by information derived from assessment of patient outcomes and organizational performance in the delivery of services. In fact, the ability to systematically collect and use indicators of patient functional, physiological, and psychological outcomes is in its infancy in the vast majority of health organizations. To all appearances, the two ingredients of an assessment of the value of an organization's care—its cost and its quality—have been addressed independently in most health care organizations and with widely differing levels of sophistication.

Attention must now be devoted to improving and applying methods for the assessment and improvement of patient care. The critical corollary of this effort is the obvious need for health care managers, governing body members and health care practitioners to work together far more closely to evaluate and improve the processes that lead to efficient delivery of quality care—that lead to real value. This must be a cross-organizational initiative that involves conscious efforts to overcome traditional, but artificial, internal barriers. The purpose of the *Agenda for Change* is to guide organizations in meeting these needs.

Drawing from its widely accepted role in fostering improvement in the quality of health care, the Joint Commission intends to apply its standard-setting, evaluation, decision-making and education capabilities to support the improvements that are clearly necessary to meet the demand for value in health care. The *Agenda for Change* is the overarching initiative that encompasses these activities. Through the *Agenda for Change*, the accreditation process and expectations of organization performance will progressively evolve over the coming decade.

Underlying Concepts of the Agenda for Change

The *Agenda for Change* is guided by the following interrelated and self-reinforcing concepts:

1. Patient outcomes are influenced by ALL of the activities of a health care organization.

   The effectiveness and efficiency with which a health care organization addresses its patients' needs is the combined result of the performance of its governance, managerial, clinical and support service functions.

2. Continual improvement in the quality of care should be a priority goal for a health care organization.

   The complexities involved in providing patient care increase almost daily. The constant evolution of medical management sciences combined with the unique characteristics of each patient, make perfection an elusive, and largely unattainable goal in health care. The unrealistic expectation that quality can be "assured" must be replaced by the more achievable goal of continual improvement. Most health care organizations are composite networks of human performance which must function effectively and efficiently to support patient care. The fragility of these systems offers many continuing opportunities for meaningful improvement.

3. The Joint Commission should focus on those activities of a health care organization that are most important to the quality of care.

   There is a finite set of activities performed by a health care organization that are essential to quality and should be addressed in national standards. Conversely, requirements that are not clearly relevant to quality of care should be deleted from existing standards.

4. Traditional standards compliance assessments should be complemented by Joint Commission collection, analysis and feedback of data that reflects the actual performance of accredited organizations in undertaking key activities.

   Health care organizations should have timely access to data that displays their own performance over time and their performance relative to others. Such data would provide the organization with both an early warning of performance areas requiring attention and a constantly evolving baseline against which to judge the effectiveness of its organization-wide program of continual improvement. Some organizations have created or arranged linkages to central databases that incorporate relevant performance measures, but many others do not have such capabilities or opportunities. Large databases provide a context for assessing individual organization performance.

Specific Objectives of the Agenda for Change

These underlying concepts lead naturally to specific objectives. These objectives address redirection of the standards, establishment of performance, monitoring capabilities, and improvement in the survey process, and are summarized below.

Objective #1—Redirection of Joint Commission Standards

There are three aspects of this objective which is expected to result in a significant net reduction in standards volume.

A. Reducing the number and complexity of standards.

   Efforts are already underway to eliminate outdated standards, to reduce standards duplication, and to delete unnecessary and constraining structural requirements, including narrowly defined assignments of responsibility. This is an on-going activity.

B. Refocusing the standards on key functions.

   Joint Commission standards have, for years, contained requirements for the performance of functions that are generally believed to be essential to the provision of quality care (e.g., control of infections, systematic performance monitoring using key indicators, matching individual credentials with demonstrated competence). The eventual intent is to reformat the standards manuals along functional, rather than structural, lines.

C. Creation of standards that provide a foundation for continual improvement.

   Current standards do not offer a cross-organizational perspective and have not directed sufficient attention to factors that are integral to effective continual improvement activities. Greater emphasis will be placed on the role of organization leaders in establishing, directing and sustaining a quality improvement program: the general methodologic requirements for systematic and broad-based quality assessment and improvement activities: and the effective management of information that supports quality assessment and improvement activities. These priority areas may in the future be supplemented by other standards development initiatives if and when additional needs become apparent.

Objective #2—Establishment of Performance Monitoring Capabilities

There is general agreement both within the health care field and among purchasers and users of health care services that external evaluation should be focused more on performance and less on capability to perform. While

standards redirection will provide a framework for this change in emphasis, there is a separate and compelling need to develop actual performance monitoring capabilities. Thus, an essential component of the *Agenda for Change* involves the creation of useful performance measures and the establishment of an interactive reference database. The articulation of clinical performance expectations (e.g., practice guidelines) is a related need that is being undertaken by a variety of other organizations. The major aspects of this *Agenda for Change* objective include the following:

A. To develop a rigorous method for the creation of valid performance measures.

There is a paucity of relevant literature and a large and growing demand upon health care organizations to provide performance data. Performance indicators should address important questions about the appropriateness, effectiveness, interpersonal and other aspects of quality care. Given the virtual absence of existing guideposts, the development of performance indicators must draw upon expert consensus, provide for appropriate testing, and apply standard requirements for evaluating performance indicators.

The Joint Commission has created a sound method for performance indicator development and intends to encourage its use by other organizations who have a clear stake in meaningful performance evaluation.

B. To develop and test sets of performance indicators that relate to the performance of key organization functions.

Key organization functions may involve the direct provision of care or may be less obvious to the patient. Indicator sets that are at various stages of development include obstetrics care, anesthesia care, oncology care, cardiovascular care, trauma care, infection control, and medication usage. Candidate areas for further Joint Commission indicator development include laboratory services, imaging services, perioperative care (including appropriateness determinations), home care, mental health services, long term care and ambulatory care.

The Joint Commission has neither the desire nor the intent to be the sole or even the primary source for indicator development. Indeed, health care organizations must themselves eventually determine the unique aspects of the services they provide and develop appropriate additional measures to monitor performance.

C. To establish affordable mechanisms for the Joint Commission and health care organizations to support data collection, transmission, analysis and feedback.

This set of activities is an essential precursor to the creation of an interactive database through which performance trends may be monitored and organizations can compare their performance with others.

An integral component of the testing of indicators is the identification of efficient and reliable methods for data handling by the health care organization and by the Joint Commission. This effort requires careful attention to data definitions, efficient approaches to data transmission, and reporting formats that are clear and useful.

D. To establish a national database that incorporates both standards compliance information and performance data.

The interplay of standards compliance and performance information should permit a more sophisticated understanding of the clinical and managerial factors that exert the greatest influence on the achievement of positive patient outcomes. This database is expected to be an important resource to health care organizations in assessing their performance and to the Joint Commission in enhancing its monitoring capabilities.

Objective #3—Improvement in the Survey Process

The Joint Commission will continue to conduct periodic on-site surveys to assess compliance with standards. These surveys must be tailored to accommodate the progressive changes in standards emphasis and to direct particular attention to the effective use of performance measures. Specific aspects of this objective include the following:

A. To direct greater attention to the effectiveness of the communication and collaboration among the governing body, management, clinicians, and support staff.

For a number of organizations, these attributes have proven to be essential in achieving excellence in patient care and organizational success.

B. To develop the capability to assess the rigor and effectiveness with which organizations apply performance measures and use the resulting data to improve performance.

Except in extreme cases of poor performance, indicator data will not per se *form the basis for accreditation decisions. The Joint Commission intends to assess the organization's application of relevant performance indicators and the effectiveness with which it addresses identified issues. Effective use of performance measures and data will thus be primarily a standards compliance consideration.*

continued

C. To reassess surveyor recruitment criteria and training requirements.

Effective evaluation and helpful consultation through the survey process will become even more important. Several options are under consideration to support the provision of both types of services.

D. To enhance the consistency of standards interpretation and the precision with which the Joint Commission makes accreditation decisions.

Attention is being directed to assuring the clarity of standards intent and to providing additional descriptions of acceptable approaches for demonstrating standards compliance. Simplification of the computerized decision process is also a high priority. These efforts are expected to further reduce variances in evaluation consistency.

Conclusion

The contemplated improvements and refinements in the accreditation process will have far-reaching implications both for the Joint Commission and for accredited health care organizations. Implementation of the *Agenda for Change* is current and is intended to be an evolutionary process in the years ahead. A successful transition will require the careful shepherding and appropriate allocation of limited resources. Further, the re-orientation to continuous improvement and the organizational culture change that this implies are daunting challenges for each health care organization. The Joint Commission believes that the change process must begin now and views itself as an important resource in assisting organizations to meet these important challenges. At the same time, the Joint Commission is committed to an ongoing assessment of the field's readiness for change and an implementation process that is progressive but not revolutionary.

The *Agenda for Change* is oriented to the future, but the future is now. In its effort to provide better services to the field, the Joint Commission is currently devoting major resources and energy to its own quality improvement program. This effort has provided a sobering appreciation of the extent of behavioral change that is required in order to effect true improvement in organizational performance. Organization leadership, staff training, and the development and use of performance indicators are all integral components of the program. This is the type of transformation envisioned by the *Agenda for Change*.

The Joint Commission's experience with the *Agenda for Change* has reaffirmed its conviction that the persistent and active search for improvement will be the most effective means for answering the public call for value in the provision of health care services. The work products of the *Agenda for Change* should serve as valuable resources for organizations as they seek to meet this objective.

Appendix L

This appendix contains an example of the the development of a single clinical indicator within the JCAHO Agenda for Change programme.

CLINICAL INDICATOR INFORMATION FORM

I INDICATOR

9(B-T1): Female patients with AJCC pathological Stage II lymph node positive primary invasive breast cancer not treated with systemic adjuvant therapy.

II DEFINITION OF TERMS

(Terms contained in the indicator which may be ambiguous or need further explanation for collection purposes.)

AJCC pathologic Stage II: 1) $T_1N_1M_0$-tumor 2 cm or less in greatest dimension; metastasis to movable ipsilateral axillary lymph nodes; no distant metastasis. 2) $T_2N_1M_0$-tumor more than 2 cm but not more than 5 cm in greatest dimension; metastasis to movable ipsilateral axillary lymph nodes; no distant metastasis.

Primary breast cancer:
174.-, category, malignant neoplasm of female breast.

Invasive: as indicated by the histologic diagnoses in the surgical pathology consultation report.

Systemic adjuvant therapy: Chemotherapy, hormonal or other systemic agents in addition to primary treatment by surgery and/or radiation therapy.
99.23, injection of a steroid
99.25, injection or infusion of cancer chemotherapeutic substance
99.29, injection or infusion of other therapeutic or prophylactic substance

III TYPE OF INDICATOR

A. This is a:

/__/ sentinel event indicator (all occurrences warrant investigation;)

or

/X/ rate based indicator (further assessment occurs if the occurrence rate shows a significant trend, exceeds predetermined thresholds or indicates significant differences when compared to peer institutions.)

B. This indicator primarily addresses:

/X/ a process of patient care;

or

/__/ a patient outcome.

IV RATIONALE

A. The reason why this indicator is useful to assess and the specific process or outcome that will be monitored.

Use of systemic adjuvant therapy as part of the patient management process has been shown to improve survival in this patient group. A significant percentage of patients not receiving this therapy may reflect on the judgement of the physician in providing a full range of treatment options to primary breast cancer patients.

B. Supportive references:

Rivers, R. Breast Cancer, Current Guidelines in Staging, Treatment and Follow-up. Postgraduate Medicine 1988; 84: 142-151.

Early Breast Cancer Trialist's Collaborative Group. N Engl J Med 1988; 319: 1681-92.

National Institues of Health Consensus Development Conference Statement: Adjuvant Chemotherapy for Breast Cancer, September 9-11, 1985. CA-A Cancer Journal for Clinicans 1986; 36: 42-47.

Fisher B, Redmond C, Brown A, et al. Adjuvant Chemotherapy With and Without Tamoxifen in the Treatmetn of Primary Breast Cancer: 5-year Results form the National Surgical Adjuvant Breast and Bowell Project Trial. J. Clin Oncol 1986; 4: 459 -471.

Jones S, Moon T, Bonadonna G, et al. Comparison of Different Trials of Adjuvant Chemotherapy in Stage II Breast Cancer Using a Natural History Data Base. Am J Clin Oncol 1987; 10 950;387 - 395.

C. The components of patient care assessed by this indicator.

1. Physician knowledge related to treatment.

2. Physician judgement related to treatment.

V DESCRIPTION OF INDICATOR POPULATION

A. Subcategories (patient subpopulations by which the indicator data will be separated for analysis.)

None

B. Indicator Data Format (the manner by which indicator data will be expressed.)

1. Rate based indicator format:

a. Numerator(s): The number of patients with AJCC pathologic stage II lymph node positive primary invasive female breast cancer not treated with systemic adjuvant therapy.

b. Denominator(s): The number of patients with AJCC pathologic stage II lymph node positive primary invasive female breast cancer.

2. Sentinel event indicator format: N/A

VI INDICATOR LOGIC

(The sequence of data element aggregation which will identify the patients assessed by the indicator.) Note: data elements are in bold type; corresponding data sources are identically numbered and listed to the right.

Data Elements	Data Sources
1. **ICD-9-CM inpatient discharge diagnosis** = primary female breast cancer (174.-)	1. facesheet discharge summary billing system
AND	
2. **ICD-9-CM procedures** =	2. facesheet discharge summary OR report billing system
a. resection of breast (85.12, 85.2-, 85.21, 85.22, 85.23, 85.4-) AND/OR b. radiation therapy (92.2-)	
AND	
3. **Stage** = II, lymph node positive	3. surgical pathology report tumor registry TNM form
AND	
4. **Histology** = invasive	4. surgical pathology report tumor registry TNM form
AND	
5. **Inpatient adjuvant therapy** ≠ chemotherapy, hormonal, or other systemic therapy (99.23, 99.25, 99.29)	5. facesheet physician progress notes nursing notes discharge summary

AND

6. **Absence of plan for outpatient adjuvant therapy** (chemotherapy, hormonal or other systemic therapy)	6. patient discharge instructions discharge summary

AND

7. **Lack of indication of outpatient adjuvant therapy on follow-up**	7. tumor registry independent patient audit form

VII UNDERLYING FACTORS

Factors not included in the indicator that may account for significant indicator rates or indicator activity.

A. Patient-based factors (factors outside the healthcare organization's control contributing to patient outcomes.)

1. Severity of illness (factors related to the degree or stage of disease prior to treatment.)

2. Co-morbid conditions (disease factors, not intrinsic to the primary disease, which may have an impact on patient suitability for, or tolerance of, diagnostic or therapeutic care.)

   a. medical contraindications to treatment

3. Other patient factors (non-disease factors which may have an impact on care, e.g., age, sex, refusal of consent.)

   a. patient refusal of therapy

   b. patient non-compliance with therapy

   c. patient socioeconomic status limits access to care.

B. Non-patient-based factors (factors related to specific healthcare practitioners, e.g., physicians, nurses, respiratory therapists.)

1. Practitioner-based factors (factors related to specific healthcare practitioners, e.g, physicians, nurses, respiratory therapists.)

a. lack of knowledge about staging

b. lack of knowledge about treatment options

c. inadequate interdisciplinary treatment planning

2. Organization-based factors (factors related to the healthcare organization which contribute to either specific aspects of patient care or to the general ability of direct care givers to provide services.)

a. inadequate patient follow-up system

b. lack of resources to deal with patient communicaiton barriers

c. inadequate discharge planning system

Appendix M

This appendix contains some information on the activities of MassPRO, the Peer Review Organisation in Massachusetts, and details of the generic quality screens that the PRO uses to review Medicare patients' care.

Massachusetts Peer Review Organization

MassPRO

PRESIDENT:	Brenda E. Richardson M.D.
EXECUTIVE DIRECTOR:	Tera S. Younger
MEDICAL DIRECTOR:	J. Peter Maselli, M.D.
FOUNDED:	The Massachusetts Peer Review Organization (MassPRO) was founded as a subsidiary of the Massachusetts Medical Society in December 1985. MassPRO began conducting reviews of inpatient Medicare hospital stays as of August 18, 1986, under a two -year contract with the Health Care Financing Administration (HCFA) retroactive until March 1, 1986 - February, 1988. Based on favorable performance evaluations, the contract has since been renewed twice: for March 1, 1988 - March 31, 1990; and for April 1, 1990 - March 31, 1993.
ORGANIZATIONAL PURPOSE:	To deliver an integrated package of review analysis and educational outreach services that encourages, and impacts positively on, the delivery of accessible, affordable, quality health care in Massachusetts. MassPRO is presently responsible for assuring the completeness, adequacy and quality of care provided to Medicare beneficiaries in Massachusetts.
AUTHORITY:	The Peer Review Improvement Act of 1982 (Public Law 97-248) authorized the creation and established the organizational requirements, functions and duties of a Federally-designated peer review organization.

SCOPE OF OPERATIONS:

For Medicare beneficiaries, MassPRO is contracted to review close to 72,000 cases, 24% of the approximate 300,000 Medicare annual discharges in Massachusetts.

MassPRO reviews the quality, appropriateness of setting for, and medical necessity of 5% of all ambulatory surgery procedures performed both in hospital outpatient departments and in free-standing ambulatory surgery centers.

MassPRO is also responsible for reviewing the quality of the care provided to Medicare beneficiaries in 11 Massachusetts, Medicare-participating Health Maintenence Organizations and in all Massachusetts Medicare-certified Skilled Nursing Facilities (SNFs) and Home Health Agencies (HHAs).

REQUIRED REVIEWS:

Hospital cases selected for review by MassPRO are subject to the following six reviews: appropriateness of admission, appropriateness of discharge, apropriateness of any invasive procedure, DRG validation, Medicare coverage and quality of care. HMO, SNF and HHA cases are subject to quality of care review only.

STAFFING:

MassPRO maintains a staff of approximately 65 RNs and LPNs, 10 ARTs and RRAs, as well as a team of 150 physicians actively practicing in all specialties. All members of MassPRO's review team undergo extensive orientation in utilization review criteria and in quality assurance activity. They receive frequent updating, consistent with changes in medical practice and review policies and procedures.

All of MassPRO's review determinations are supported by physician-confirmed rationales.

FOR MORE INFORMATION:

For more information contact:
Tera S. Younger, Executive Director
or Pat McDonald, Director of Community Outreach and Public Affairs
MassPRO
Box 9007 Bear Hill Road
Waltham, MA 02254-9007
1-617-890-0011

ELEMENTS	EXCLUSIONS	EXPLANATORY NOTES
*1. Adequacy of Discharge Planning No documentation of discharge planning or appropriate followup care with consideration of physical, emotional and mental status needs at time of discharge.	Death; transfer to an acute, short-term, general hospital or swing bed status; patient left AMA	Discharge planning is appropriate for all patients. Discharge planning is a generic term which covers a range of care from the simple to the complex. The plan should be developed timely, as defined by the patient's needs, and must meet these needs at time of discharge. Documentation must be present which addresses the following elements of a discharge plan: o A needs assessment; o Development of plan; and o Initiation of appropriate arrangements and obtaining appropriate resources to ensure smooth transition to post-hospital level of care. The plan should reflect appropriate transition of care, identify additional resources needed, and provide appropriate teaching or transmission of pertinent information. A screen failure occurs when a discharge plan is not documented. A confirmed problem occurs when the patient had needs which were not met.
2. Medical Stability of the Patient		
a. BP within 24 hours of discharge (systolic less than 85 or greater than 180; diastolic less than 50 or greater than 110)	Death; transfer to an acute, short-term, general hospital; patient left AMA	This entire category (medical stability of patient) identifies aberrant clinical data which has not been recognized or which has been inadequately treated during the hospitalization. A single abnormal vital sign or laboratory result may be in error. Therefore, serial determinations should be sought. Where serial determinations are not available, corroborating evidence of clinical instability should be identified. There should be evidence in the medical record that action was taken to address the problem prior to discharge. A screen failure is defined as more than one abnormal reading within 24 hours of discharge or one abnormal reading within 24 hours of discharge where a subsequent normal reading is not documented.

ELEMENTS	EXCLUSIONS	EXPLANATORY NOTES
b. Temperature within 24 hours of discharge greater than 101 degrees fahrenheit (38.3 Centigrade) oral, (greater than 102 degrees fahrenheit (38.9 Centigrade) rectal)	Death; transfer to an acute, short-term, general hospital; patient left AMA	Same as 2.a.
c. Pulse less than 50 (or 45 if the patient is on a beta blocker), or greater than 120 within 24 hours of discharge	Death; transfer to an acute, short-term, general hospital; patient left AMA	Same as 2.a.
d. Abnormal diagnostic findings which are not addressed and resolved, or where the record does not explain why they are not resolved	None	Abnormal findings are defined as those results which fall outside of normal or acceptable limits for the test or physical findings as defined by the laboratory or facility performing the test. Abnormal test results or physical findings would not be identified as an occurrence (screen failure) if the medical record indicated acknowledgment of the abnormal test result or physical finding and documented appropriate and timely therapeutic intervention prior to the patient's discharge. The following examples, if identified in the medical record, would not be considered a confirmed problem: 1. Medical condition or treatment for same explains abnormal values - e.g., patient with known cancer of liver has elevated SGOT. 2. Patient refuses medical treatment - e.g., Jehovah Witness. 3. Treatment begun in hospital will continue as outpatient or followup as outpatient. (lab value should be within discharge screen criteria.) 4. Minimum elevated values which are not clinically significant (as with glucose, cholesterol). 5. Death before abnormal finding could be addressed. 6. Patient left AMA before abnormal finding could be addressed.

ELEMENTS	EXCLUSIONS	EXPLANATORY NOTES
e. IV fluids or drugs after 12 midnight on day of discharge	Death; transfer to an acute, short-term, general hospital or Medicare-covered SNF; patient left AMA; KVO's; antibiotics; chemotherapy; total parenteral nutrition; heparin given to maintain a heparin lock	
f. Purulent or bloody drainage of wound or open area within 24 hours prior to discharge.	Transfer to an acute, short-term, general hospital; death; patient left AMA	This element is defined as an adverse change in the healing of a wound or open area. Screen failures would include, but not be limited to, drainage that has significantly increased or decreased within 24 hours prior to discharge. A confirmed problem would be reported if it was medically inappropriate to discharge the patient with this degree of drainage.
3. Deaths		
a. During or following any surgery performed during the current admission	None	Confirmed problem would be recorded for any intraoperative or postoperative death if such death resulted from inadequate preoperative assessment, inadequate postoperative care or improper procedures which resulted in surgical or anesthesia complications.
b. Following return to intensive care unit, coronary care or other special care unit within 24 hours of being transferred out	None	
c. Other unexpected death	None	Unexpected death is defined as death occurring when there had been a reasonable expectation on admission that the patient would recover (i.e., where there was no documented expectation of possible death).

ELEMENTS	EXCLUSIONS	EXPLANATORY NOTES
*4. Nosocomial Infection (Hospital acquired infection)	None	A screen failure is not necessarily a confirmed problem. A screen failure occurs when more than one indicator of an infection is identified more than 72 hours after admission. Indicators: 1. Temperature elevation of 101 degrees fahrenheit or greater (oral) (38.9 Centigrade) 2. Elevated WBC and/or left shift. 3. Isolation of organism from body fluids or specimens. 4. Appropriate radiographic imaging abnormalities. 5. Purulent drainage 6. Heat, redness, focal tenderness and/or pain. 7. Pyuria, dysuria. 8. Productive cough. When the case has two or more indications of a nosocomial infection (i.e., a screen failure), you are encouraged to refer to the CDC's guidelines to determine whether there was a nosocomial infection. The presence of a nosocomial infection is always a confirmed quality problem. Treatment of the nosocomial infection does not negate the confirmed quality problem.
5. Unscheduled Return to Surgery within same admission for same condition as previous surgery or to correct operative problem	"Staged" procedures	Unscheduled surgery is an unexpected return to surgery and is not limited to the procedure being performed in the operating suite. Example: Surgical repair of a wound separation performed in a patient's room is considered an unscheduled return to surgery.

ELEMENTS	EXCLUSIONS	EXPLANATORY NOTES
6. Trauma Suffered in the Hospital		
a. Unplanned surgery which includes, but is not limited to, removal or repair of a normal organ or body part (i.e., surgery not addressed specifically in the operative consent)	None	
b. Fall	None	"Falls" are the key to failing the screen, not the degree of injury. A fall with or without injury is a quality concern. The concern may be due to the hospital's negligence or to the injury incurred by the patient. A screen failure exists if a fall occurred. A confirmed problem exists if the fall was avoidable. A confirmed problem also exists if the fall was not properly followed up, whether or not the fall was avoidable.
c. Serious complications of anesthesia	None	This is defined as complications related only to anesthesia. (This would not include problems resulting from the surgical procedure.) Serious complications would include any condition which increases the patient's morbidity or possibility of mortality, or results in an increased length of stay with the use of special equipment to support the patient during recovery from the complication. Anesthesia complications would include but <u>are not limited to</u>: General anesthesia: 1. Anoxia 2. Laryngospasm 3. Anaphylaxis 4. Aspiration with pulmonary complications 5. Unplanned retained foreign body 6. Reintubation within 24 hours of extubation 7. Seizures occurring intraoperatively or within 24 hours post-op Spinal anesthesia: Indications of paralysis or paresis present at discharge

ELEMENTS	EXCLUSIONS	EXPLANATORY NOTES
d. Any transfusion error or serious transfusion reaction	None	Transfusion error or serious reaction would include administration of incompatible blood products or any reaction that was unrecognized and untreated which, for example, resulted in signs or symptoms of hemolysis, severe circulatory overload, anaphylactic reactions, coagulation complications, hepatitis, renal failure, or cardiac arrest.
* e. Hospital acquired decubitus ulcer and/or deterioration of an existing decubitus	Readmission for treatment of decubitus ulcer acquired previously	Decubitus ulcer is defined as a break in the skin, regardless of the size and depth, caused by prolonged pressure over a pressure point.
f. Medication error or adverse drug reaction (1) with serious potential for harm or (2) resulting in measures to correct	None	The process is to be looked at as well as the outcome. The following are examples of errors which may have a potential for harm or result in actual harm. 1. Incorrect antibiotic ordered by the physician (e.g., inconsistent with diagnostic studies or the patient's history of drug allergy). 2. No diagnostic studies to confirm which drug is correct to administer (e.g., C & S). 3. Serum drug levels not performed as needed. 4. Diagnostic studies or other measures for side effects not performed as needed (e.g., renal function tests and I&O for patients on aminoglycocides). Measures to correct include, but are not limited to, intubation, cardiopulmonary resuscitation, gastric lavage, dialysis, or medications.
g. Care or lack of care resulting in serious or potentially serious complications.	None	Care or lack of care is defined as inappropriate or untimely assessment, intervention, and/or management.

* PRO reviewer is to record the failure of the screen, but need not refer potential Severity level I quality problems to physician reviewer until a pattern emerges.

Examples of Application of Severity Levels

Level III. Medical mismanagement with significant adverse effects on the patient. Examples of quality problems meeting the conditions for a Level III determination:

1. Antibiotic sensitivity tests are not ordered for a patient with septicemia, the organism is not sensitive to the antibiotic administered, an appropriate antibiotic is not selected in a timely manner, and significant harm results (e.g., prolonged hospitalization, death).

2. Appropriate monitoring and timely recognition/treatment of potentially life threatening arrhythmias is not provided for a patient with acute myocardial infarction, and significant harm results (e.g., prolonged hospitilization, cardiac arrest, death).

3. Inappropriate administration of intravenous fluids or medication (e.g., excessive amount or rate, incorrect fluid or concentration of medication), error not corrected in a timely manner, and significant harm results (e.g., prolonged hospitalization, pulmonary edema, cardiac arrest, death).*

4. Electrolyte abnormalities are not monitored/treated in a timely manner, patient experiences marked mental status changes due to electrolyte imbalance, falls, and sustains a hip fracture, which requires surgery.*

5. A patient who is unstable at discharge is readmitted for the same or related condition for treatment that was not provided during the initial admission:

   e.g., a patient discharged without treatment for a urinary tract infection discovered prior to discharge is readmitted with septicemia due to the urinary tract infection.

   e.g., a hypertensive patient without prior neurological deficits develops progressive neurological deficits on the day of discharge; patient is discharged and is subsequently readmitted with hemiparesis.

6. Elective major surgery on a patient with preoperative evidence of an unstable acute medical condition (e.g., acute myocardial infarction, pneumonia) and significant harm results (e.g., unnecessarily prolonged hospitalization, infarct extension, death)

7. Life saving/sustaining equipment (e.g., defibrillator, ventilator, telemetry) used in an emergency fails as a result of inadequate maintenance and results in significant harm (e.g., prolonged hospitalization, cardiac arrest, death).

8. Failure to provide sufficient hospital personnel/services (e.g., nurses, laboratory technicians, telemetry) places patients at significant risk and significant harm results (e.g., unnecessarily prolonged hospitalization, death).

Level II. Medical mismangement with the potential for significant adverse effects on the patient. Examples of quality problems meeting the conditions for a Level II:

1. Antibiotic sensitivity tests are not ordered for a patient with septicemia, the organism is not sensitive to the antibiotic administered; however, an appropriate antibiotic is selected in a timely manner, and no significant harm results.

2. Appropriate monitoring and timely recognition/treatment of potentially life threatening arrhythmias is not provided for a patient with acute myocardial infarction, but no significant harm results.*

3. Inappropriate administration of intravenous fluids or medication (e.g., excessive amount or rate, incorrect fluid or concentration of medication), error corrected prior to development of significant complications and no significant harm results.*

4. Electrolyte abnormalities are not monitored/treated in a timely manner, patient experiences marked mental status changes due to electrolyte imbalance, but recovers without long lasting effects.

5. Elective major surgery performed on a patient with preoperative evidence of an unstable acute medical condition (e.g., acute myocardial infarction, pneumonia) but no significant harm results.

6. Patient with known severe COPD, administered an inappropriately high concentration of oxygen, is inadequately monitored and develops increasing somnolence; CO_2 retention is identified in a timely manner, appropriate treatment is initiated, and patient recovers without significant harm.

7. Life saving/sustaining equipment (e.g., defibrillator, ventilator, telemetry) used in an emergency fails as a result of inadequate maintenance, but no significant harm results.

8. Failure to provide sufficient hospital personnel/services (e.g., nurses, laboratory tehcnicians, telemetry) such that patients are placed at significant risk, but no significant harm results.*

Level I. Medical mismanagement without potential for significant adverse effects on the patient. Examples of quality problems meeting the conditions for a Level I determination:

1. Inadequate medical record documentation (e.g., absent or inadequate history and physical, progress notes, preoperative/operative report, nurses notes, discharge summary).*

2. Patient with mildly abnormal laboratory findings is discharged without adequate documentation, evaluation and/or appropriate plans for follow-up (e.g., repeat laboratory test, outpatient workup).

   e.g., asymptomatic patient with mild bacteriuria and pyuria, discharged without adequate evaluation and/or appropriate plans for follow-up evaluation (e.g., repeat urinalysis, urine culture).

3. Hospital acquired decubitus ulcer, appropriate treatment initiated in a timely manner, and no significant harm results.*

4. Failure to provide an effective discharge planning service but the patient's unmet needs were minimal.*

   e.g., patient with slight hemiparesis discharged without adequate discharge planning.*

*(May be a practitioner problem, provider problem or both.)

The entire medical record is to be reviewed for the application of these generic screens. In addition, when reviewing for Screen 1, "Discharge Planning", the PRO should request social service notes in addition to the entire medical record if these notes are maintained outside the medical record. The PRO has authority to obtain incident reports and quality assurance records in conjunction with its review of element 6b "Fail" and incident reports for element 6f "Medication error or adverse drug reaction". If, however, this information is available in the individual patient's medical record, the PRO need not obtain the incident report or quality assurance record to perform this review.

"FAIL" VERSUS "NOT APPLICABLE"

A screen failure is a screen occurrence. Example: the patient was returned to surgery within the same admission to correct an operative problem (i.e., not a staged procedure). The fact that the patient was returned to surgery, regardless of reason or treatment, causes it to be a screen failure. A "not applicable" is when the screen does not apply to the particular case under review. Example: a patient who left AMA did not have a discharge plan. Cases where the patient left AMA are excluded from review against the discharge planning screen. Therefore, the screen is "not applicable" to that case.

A screen failure equates to a screen occurrence. If the fact occurred, then the screen is failed (see examples below). No medical judgment is used at this point. Screen 2., element d. is the only element where medical judgment is used to determine if there is a screen failure. In this element the nurse reviewer must determine if the findings are abnormal and if they were addressed or resolved before the determination is made as to whether the screen is failed.

Examples of screen occurrence equals screen failure.

1. B.P. 24 hours prior to discharge was 190/110. (Screen 2.a.)

2. Patient fell. (Screen 6.b.)

3. Patient has elevated WBC and focal tenderness. (Screen 4)

4. Patient developed a decubitus ulcer while in the hospital. (Screen 6.e.)

5. Patient had a serious complication from anesthesia. (Screen 6.c.)

CONFIRMED PROBLEMS

Medical judgment is used in determining whether these are confirmed problems. For example:

1. Was this a "normal" B.P. for this patient? Was the patient on appropriate medications? Did the discharge plan indicate appropriate followup?

2. Was the fall avoidable? Did negligence or mismanagement cause the fall? Was there appropriate followup care?

3. Did the patient have a nosocomial infection according to medical knowledge and the CDC guidelines?

4. Was the decubitus preventable? Did poor care attribute to its formation? Did it prolong the hospital stay?

5. Did an error cause the complication? Did the complication prolong the hospital stay?

Appendix N

This appendix contains an itinerary for the study visit, indicating the organisations and individuals visited.

NHSTA/Kings Fund Travel Fellowship
USA Study Visit - Kieran Walshe
20th October 1990 to 4th November 1990

Boston	New England Medical Center
	MassPro - Massachussetts Peer Review Organisation
Detroit	Henry Ford Hospital
Ann Arbor	Commission on Professional Hospital Activities (CPHA)
	Catherine McAuley Health Center
	Sisters of Mercy Health Services corporation
Chicago	Joint Commission on the Accreditation of Healthcare Organisations (JCAHO)
	Evangelical Health Systems
	Good Samaritan Hospital
Baltimore	Johns Hopkins Health System
	Homewood Hospital
Washington	National Institutes of Health