

Quality improvement in ambulatory surgery – the US perspective

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Continuous evaluation of performance and outcomes leading to improvement is currently the focus of continuous quality improvement (CQI) programmes in ambulatory surgery. This can be implemented by developing clinical indicators and acceptable thresholds that are relevant to daily practice, easy to measure and can be used to initiate the analytic process. Collection of data without the ability to analyse it or develop corrective measures is futile. A cooperative effort between physicians, nurses, administrators and other personnel is essential in identifying the responsible individuals for facilitating the programme. Steps in developing a hospital-integrated and free-standing facility are provided and several examples described.

Key words: Ambulatory surgery, quality assurance, continuous quality improvement (CQI)

Introduction

Continuous quality assessment and improvement (CQI) programmes in ambulatory surgery are geared towards maintaining high quality of patient care and services and ensuring effective utilization of those services and resources. These concepts are not unique to ambulatory surgery. In fact, in the US, the medical field has derived the basic tenets of quality improvement from market industry: customer satisfaction, quality control of goods and services and continuous assessment of the processes^{1,2}. Efforts to develop feasible and acceptable methods to assess and assure good quality care have intensified in the US as the government, third-party payers and the general public have become interested in the quality and outcome of health services. Perhaps one of the most notable changes within medicine is the evolution of ambulatory surgery, comprising in the US close to 60% of all elective surgeries. With the intensified effort under proposed healthcare reforms to increase the accessibility of healthcare to Americans, quality improvement and outcome analysis of ambulatory surgery will be even more crucial. Assessing quality requires that attention is given to patient acceptability and satisfaction as well as to the monitoring of clinical outcomes. These form the basis of a continuous quality improvement programme for ambulatory surgery units (ASUs). Their application to a clinically useful programme will be addressed.

Accountability in the health field is not a new notion. Concern for the adequacy of medical care can be traced to the introduction of medical audits in general hospitals following World War I. The role of the Federal Government has been central to the evolution of quality assessment, mainly through legislative and administrative actions. Peer review organizations and development of utilization review committees became so well integrated in the medical system that they are now accepted practice within hospitals and institutions, along with requirements to earn accreditation and reimbursement. The two major uses of quality improvement data are: problem solving that results in improved patient care, and credentialing physicians and other healthcare personnel³.

Transition to continuous quality improvement (CQI)

Traditional quality assurance (QA), implemented in the 1980s, focused largely on the performance of individual healthcare providers that was below accepted standards and that led to adverse patient care outcomes. This resulted in activities designed to focus corrective measures only at individual problems, frequently taking action only to please outside inspections⁴. The 'bad apple' philosophy inevitably was viewed as a punitive approach to retrospective events. As a result, a modification of the QA model led to the recent development of continuous quality improvement (CQI)⁵. CQI has now become standard language for monitoring and evaluating the capacity and effectiveness of health care in ambulatory surgery in the US. This new paradigm focuses on the performance of the organization within its operating system^{6,7}. By analysing human performance in the context of the system in which patient care

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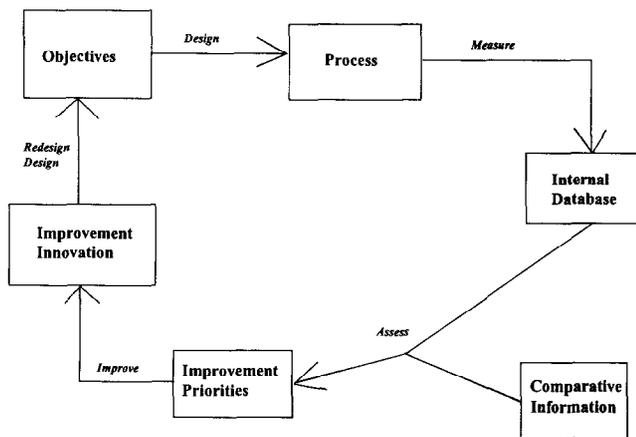


Figure 1. CQI performance-improvement cycle. Entry at any point in the performance-improvement cycle can initiate the CQI process.

is provided, global assessment and recommendations for improvement can be made. It is estimated that 80–90% of adverse outcomes result from faulty systems, while only 10–20% actually result from human errors⁸. CQI recognizes that the performance-improvement cycle is connected by the actions of organizational leaders, managers, physicians, other clinicians, trustees and support staff who design, measure, assess and improve their work processes⁹. The performance-improvement cycle of the CQI paradigm has no beginning and no end. An organization may start its improvement effort at any point. This may be the result of modifying an existing clinical process, measuring patient outcomes, comparing performance to other organizations, designing a new service, prioritizing certain issues, or by finding new ways of carrying out functions (Figure 1).

The CQI paradigm incorporates three basic components in its evaluation phase: structure, process and outcome¹⁰. Structure refers to the organization and resources of the ASU used to render patient care. Assessment of structure involves ongoing monitoring and evaluation to ensure that the physical facilities and equipment are adequate. Process refers to how the organization functions to provide patient care. Assessment of process ensures that there is adequate documentation of appropriate patient management throughout the perioperative period. This information is obtained from the patient's medical record. Outcome refers to actual changes in health status experienced by the patient as a result of medical care. Outcome evaluation has become a major focus. However, process evaluation is gaining renewed interest, as doctors and other healthcare providers are gaining an increased appreciation of the importance of the systems required to ensure the provision of quality health care. Improvements occurring as a result of the integration of these three components should be the direction of the CQI programme.

While the primary focus of CQI has shifted, it still recognizes the importance of individual competence of the medical and hospital staff. Institutional obstacles

must be removed in order to motivate employees and allow them to work at peak performance. The leaders of the healthcare organization must be committed and play an active role to foster the CQI process. These leaders can be administrative, clinical or staff leaders and should be knowledgeable in the concepts and techniques of quality improvement and the processes and systems in their organization. Additionally, they must provide the resources necessary when actions take place and re-evaluate the results. Communication and productivity are encouraged so that all personnel can identify problems and offer solutions.

Regulation of CQI programmes

CQI programmes in ASUs in the US are governed strongly by the two major American accreditation organizations that are involved in the licensing and accreditation of those facilities: The Joint Commission of Accreditation of Healthcare Organizations (JCAHO) and the Accreditation Association for Ambulatory Health Care (AAAHC). The purpose of these organizations is to organize and operate a peer-based assessment, education and accreditation programme for healthcare organizations so that the highest level of care is provided for recipients in an efficient and economically sound manner. Both the JCAHO and the AAAHC have developed accreditation manuals that are periodically revised and updated. To permit flexibility and encourage innovation and variation, no particular method of conducting quality assurance activities is specified. However, ongoing monitoring of care without evidence of resolving problems does not fulfill the standards³.

The JCAHO is primarily involved in hospital-based or affiliated ASUs, and its accreditation manual addresses processes that involve improving organizational performance as reflected in the recent transition from QA to CQI⁹. Previous standards that were specifically identified as 'surgery and anaesthesia services' are now spread throughout the manual and included under standards for assessment of patients (PE), leadership (LD), management of information (IM), improving organizational performance (PI) and medical staff (MS), in addition to a smaller section on surgical and anaesthesia services. These changes are intended to facilitate the organization's continuous evaluation of performance and outcomes leading to improvement.

The AAAHC, which was incorporated in 1979, has been leading the way in the evaluation, accreditation and recognition of high-quality ambulatory healthcare organizations. Some of its members are the Federated Ambulatory Surgery Association (FASA), the American Society of Outpatient Surgeons, the Outpatient Ophthalmic Surgery Society and the American Academy of Facial Plastic and Reconstructive Surgery. Ambulatory surgery centres accredited by the AAAHC also meet conditions for participation in reimbursement programmes and some have also received major professional liability discounts. The accreditation handbook

Table 1. Steps in the CQI process^{8,9}

Identify the problem to be addressed
Identify the team to work on the problem
Define relevant terms
Delineate potential causes of the problem
Identify data to be collected
Collect data, including contributions of potential causes of problem
Establish a control that defines baseline state and outliers that might require specific corrective action
Utilize statistics or diagrams (bar graphs, pie charts) to identify the most influential causes of the problem
Analyse the most influential causes
Carry out corrective action
Collect another set of data after corrective action is taken
Utilize statistics or diagrams showing the situation after corrective action was taken
Analyse the most influential causes after corrective action is taken
Continue periodic monitoring

has specific sections relating to quality assurance, surgery and anaesthesia services and core standards and is periodically revised. There appears to be more flexibility in these standards, recognizing that surgical centres do not have the highly integrated programmes of hospital organizations. At least two doctors are needed to provide peer-based review. In office-based surgical practices, an outside doctor should be involved in order to provide peer-based review. The quality improvement programme of these facilities should address clinical, administrative and cost-of-care issues as well as actual or potential problems affecting patient outcomes. Exclusive concentration on administrative or cost-of-care issues does not fulfil this requirement^{3,11}.

The standards of care promulgated by the American Society of Anesthesiologists include basic anaesthesia monitoring, pre- and postanaesthetic care and other guidelines relevant to ambulatory surgery and anaesthesia, and can be used as a foundation for an ambulatory surgery CQI programme. Anaesthesia-related indicators and system problems have included airway, cardiovascular, respiratory, neurological, regional anaesthesia, miscellaneous, discharge planning and catastrophic events. Various decision trees and incident analysis forms have been developed that can be adapted into individual facility programmes⁸.

Structure of a CQI programme

There are two essential parts to any quality improvement system. The first involves the gathering of data and the second is the evaluation of that data. Collection of relevant data in an objective and non-biased manner should enhance the utility of the performance-improvement cycle. In order to support this model, the health-care organization should provide adequate personnel and physical facilities to obtain the necessary data to be evaluated. A programme is developed that must have an objective and systematic assessment of the cause of those problems; implement actions designed to eliminate or improve the identified issues; monitor and evaluate the activities and document that the highest quality of patient care and services are provided. In addition,

there must be an overall appraisal of the hospital or surgery centre's performance in quality assessment and improvement activities. Data are collected both for the priority issues chosen for improvement and as part of continuing measurement. Table 1 outlines those steps.

Through the use of clinically relevant indicators and complementary methods, information is obtained assessing the actual performance of the ASU and its staff. Information concerning outcome may be obtained from external data sources and internal data sources. Professional review organization reports or professional liability actions are external data sources. Internal data sources consist of the patient's medical record, infection control reports, blood utilization reports, patients surveys, morbidity and mortality statistics, interdepartmental referrals and incident reports³ (Figure 2). Each facility must not only establish clinical indicators but also thresholds for each of the indicators used by the department. Clinical indicators are used only to initiate the analytical process. They themselves provide neither qualitative nor quantitative evidence of quality. Assessing whether data collection is actually contributing to system changes or existing for its own sake, will improve the efficiency in data management.

CQI committee

Typically, the ASU CQI committee is made up of the medical director, (anaesthesiologist), and when appropriate other members of the anaesthesia care team (e.g. other anaesthesiologists, residents, nurse anaesthetists), in addition to surgeons, the nursing director, ASU nurses and postanaesthesia care nurses, administrators, the director of the admitting and presurgical testing department, infection control and hospital quality assurance representatives. The committee should meet regularly to review issues. Both an integrated-hospital ASU and free-standing ASU should have an integrated committee allowing input from the different representatives. A hospital-integrated ASU allows for broader integration, where referrals are made to the different departments and the committee members serve as a liaison, providing follow-up. The medical director or

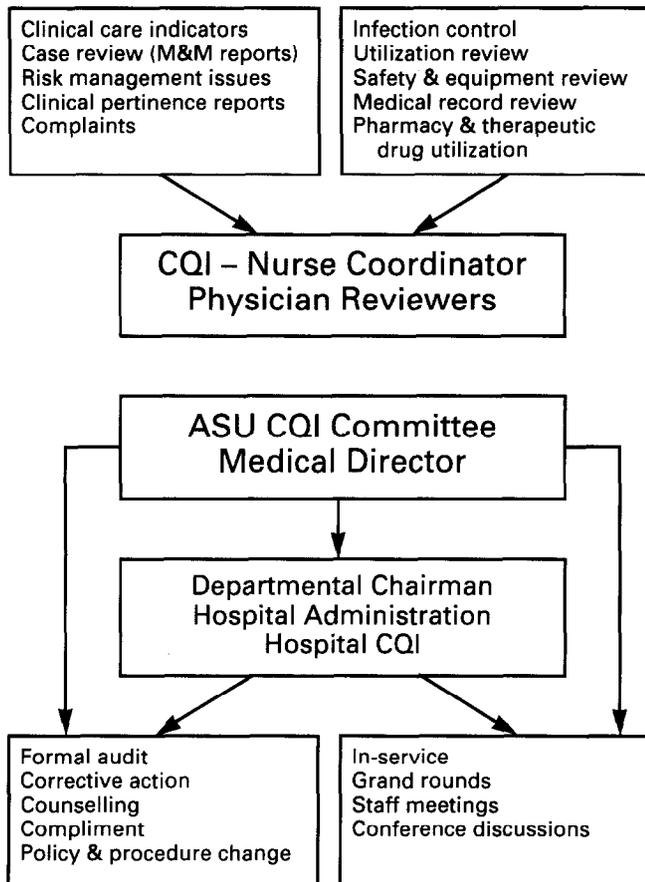


Figure 2. ASU continuous quality improvement programme. The integrated approach to CQI requires input from multiple sources. ASU, ambulatory surgery unit; M&M, morbidity and mortality. (Reproduced from Twersky 1992, with permission.)

quality improvement support person serve as the committee chair and documented minutes of the meetings are kept. The medical director also reports directly to the hospital-wide quality assurance department, operating room and ASU committees. This integration can also occur within a free-standing facility among the same representatives. The composition of the committee allows for responsiveness to the philosophy of integrated CQI.

Corrective actions

An important part of the peer review process is to recommend ways by which quality of care can be improved. It becomes the responsibility of the medical director, or other appropriate departments to hold discussions with the staff, usually at department meetings. The CQI philosophy welcomes any hint or suggestion that a quality problem may exist; it is investigated by the appropriate personnel and corrective action is taken. Feedback to the provider involved with the case is essential. Quality problems involving providers are often amenable to solution through educational means: by providing continuing medical education, inservice classes, additional reference sources and restructuring existing education procedures (Figure 2). Sometimes

just becoming aware that a problem exists is all that is needed for a motivated person to solve that problem. Correction of system defects involves increasing or reassigning staff, altering the use of equipment and supplies and improving methods of communication. Correction of deficient behaviour or performance is best accomplished by counselling staff, altering physician privileges, increased supervision and when necessary, disciplinary action. Whatever approach is taken, individual performance problems should be dealt with in a spirit that fosters personal improvement and improved department performance. Emphasis on quality as a team objective is helpful. Punitive overtones are usually counterproductive. Driving out fear is particularly important. Improvement of patient care is much more likely to result when interdepartmental teams work together than when problems are segregated.

CQI programmes

Hospital-integrated ASU

A hospital-integrated ASU serves as an excellent example of how a CQI programme can integrate the multispeciality services that provide care in its facility. Data collection and chart reviews are a shared responsibility from among the members of the CQI committee as well as from the ASU personnel. The programme described below provides a practical approach by utilizing clinical indicators oriented towards patient outcome, serving as regular markers for the assessment of care. Modifications of the CQI programme are made when necessary, as well as an annual re-evaluation.

While each facility must determine on its own what is clinically relevant, the following indicators have provided the author's facility with the ability to assess the quality of its healthcare services (Table 2). These particular markers may overlap one another, and therefore individual ASUs may modify them depending both on their applicability and on the resources available to facilitate data collection and evaluation. Collection of data without the ability to analyse it properly or develop corrective measures is ineffective and worthless.

These clinical indicators are assessed continually and reviewed monthly at the CQI committee meetings.

Patient satisfaction

Questionnaires are distributed to the patients during the presurgical testing process and prior to discharge

Table 2. CQI Clinical indicators for hospital-integrated ASU

Patient satisfaction
Preoperative delays and incidents
Preoperative cancellations
Postoperative follow-up
Readmission to hospital following discharge
Postanaesthesia care unit (PACU) and step-down recovery occurrences
Discharge delay
Infection control
Admission from the ASU
Medical record documentation

following surgery. Patients rate their satisfaction with presurgical testing, anaesthesia, nursing and surgical staff and general preparedness for surgery. Anonymous responses are reviewed. Examples of issues encountered and corrective actions include:

1. Long waiting time during presurgical testing – following a time-study, a threshold for average time spent was determined. Staff assignments were redistributed and extended hours were provided in order to schedule patients so they could be examined within the acceptable time frame. Additionally, a patient information brochure was developed in order to improve patient preparation for presurgical testing.
2. Patient's confidentiality and privacy – individual cubicles are separated by curtains in the ASU; a consultation room is available for physicians to speak to family members; larger-sized gowns and disposable pants are available.

Preoperative delays and incidents

Efficient use of the operating room requires minimal delays regardless of whether they are the result of patient, doctor, staff or facility factors. Delays are tracked and trended and reported monthly. Examples of issues and corrective actions include:

1. Delays – patients are instructed to arrive 2 h prior to surgery; some surgeons have requested that all their scheduled patients arrive at the same time to allow for flexibility in cases should a delay be encountered.
ASU cases are prioritized in the schedule to permit completion of cases and sufficient recovery within the operating hours of the facility. While this may not always be feasible in an integrated operating room, it is strongly encouraged. Additionally, should radiological or laboratory tests be required preoperatively, ASU patients are prioritized.
2. Preoperative medication not given 1 h prior to surgery – the doctor is now notified by the nursing staff when this occurs and when feasible, an intravenous form is ordered; in some circumstances, patients are instructed to take medication at home prior to leaving for hospital.

Other incidents include falls, drug reactions, medication errors – although infrequent, their occurrence would require evaluation within the 'structure, process, outcome' paradigm to determine if corrective action could be taken.

Preoperative cancellations

Another measure of efficiency is by keeping cancellations to a minimum (below 2%). By tracking and trending the various reasons for cancellations, efforts can be directed at correcting the causes. A change in medical status of the patient from the time of presurgical testing until the day of surgery accounts for the majority of

cancellations and cannot be reduced. Other reasons for cancellation may include medical work-up not being completed, equipment problems, patient refusal, patient not showing up, NPO orders not maintained. Some of these may reflect system errors and should be trended to identify whether they are provider- or patient-related.

Postoperative follow-up (including readmission and infection control)

Patients are contacted by telephone 24–72 h postoperatively to assess their recovery. This author's facility instituted an evening phone call to patients that are classified as ASA 3 or higher. Some facilities have an additional patient contact at 7 and 30 days postoperatively¹². It has been reported that morbidity and mortality following ambulatory surgery is rare^{13–15}. However, each facility must track and trend its own morbidities and mortalities.

Readmission following discharge: To supplement the nurse's postoperative phone call, the hospital's computerized database will identify patients that were readmitted to its hospital or returned to the emergency department within 30 days following ambulatory surgery. Readmissions are frequently anticipated and related to the original surgery (i.e. scheduled mastectomy, treatment with additional chemotherapy, lithotripsy). No further action is taken, however, emergency department visits are also reviewed to determine whether they are surgically related (see below). All problems encountered by the nursing staff are recorded for review and referred to the surgeon or anaesthesiologist when appropriate.

Infection control: Postoperative follow-up serves as one of the resources for identifying postoperative infections. While postdischarge fever and wound infection occur very infrequently following ambulatory surgery, their incidence is tracked and trended. ASUs are not uniform in their method for tracking this parameter^{16–19}. Frequent use of perioperative antibiotics and discharge prescriptions explains this facility's overall low incidence of postoperative infection. Admission to the hospital immediately following ambulatory surgery, related to fever and need for parenteral antibiotics would also be included in infection control evaluation. Examples of issues encountered and corrective actions include:

1. Patients returning to the emergency department following discharge – the most common reason for returning to the emergency room in the author's institution was because of bleeding, following dilatation and curettage (D&C) or termination of pregnancy. Because bleeding was not significant in the majority of cases, specific discharge instructions were developed by the Department of Gynaecology to address commonly anticipated problems specific for these procedures. This parameter also highlighted the availability of surgeons during off-hours and identified the need of some providers to sched-

dule postoperative follow-up appointments on weekends.

2. Common side effects following surgery and anaesthesia – this is reported very infrequently subsequent to written and verbal discharge instructions provided to the patients and their family members. Additionally, when the anaesthesiologist evaluates the patient for discharge, he/she explains again the common side effects anticipated following anaesthesia. Patients that have received spinal or epidural anaesthesia are provided with a 'phone number to call should they develop postdural puncture headache following the initial follow-up 'phone call.

Postanaesthesia care unit (PACU) and step-down recovery

Occurrences: While there is no minimum stay post-operatively in the ASU, certain occurrences would result in prolonged stay and additional intervention. These may include postoperative cardiorespiratory events requiring medical treatment, (i.e. reintubation, bronchospasm, hypertension, hypotension, arrhythmias, etc.) or admission to the hospital. Their occurrence should be evaluated and trended. Each facility must develop an acceptable threshold of postoperative events evaluating only those occurrences that fall out of the threshold.

Discharge delay: With the use of appropriately-tailored anaesthetics, patients are frequently discharged within 2 h of surgery. However, the need for continued observation as discussed above should be tracked and trended. Pain management and nausea and vomiting account for delay in discharge and have highlighted the need to treat these symptoms quickly and appropriately. Patients waiting for their escorts account for delay in discharge; lack of patient escort occurs infrequently, resulting either in hospital admission or patient signing out against medical advice. All attempts are made to discourage this practice. Examples of issues encountered and corrective actions include:

1. Inability to void – a re-evaluation of voiding as a criteria for discharge enabled patients to be discharged sooner. However, patients that received spinal or epidural anaesthesia, or those who underwent anorectal, urological or hernia procedures, or as specified by the surgeon are required to void prior to discharge.

Admission from ASU

All admissions from the ASU are reviewed and categorized into surgical, anaesthesia, medical, social, administrative or miscellaneous reasons. Surgical reasons still account for the majority of admissions and may include: more extensive surgery, bleeding, surgical complications, inappropriately booked as ASU and antibiotic treatment. Integrated-hospital facilities vary in their admission rates²⁰⁻²². This facility averages about 2%. While it may seem that admissions may be unantic-

ipated, many may be predicted and efforts at reducing those should be actively sought^{20,23}. Anaesthesia or anaesthesia-surgery-related reasons may include pain, nausea and vomiting, respiratory observation, or prolonged recovery from anaesthesia. Appropriate selection of short-acting general and local anaesthetics should be incorporated into anaesthetic practice, in addition to instituting strategies to reduce pain and nausea and vomiting. Administrative reasons may be related to the structure of the ASU, resulting in late starts in the operating room. This may necessitate prioritizing ASU cases or extending the operating hours to accommodate the scheduled cases. Each admission and surgeon's response is reviewed. When needed, referrals are made to the department chairmen. Examples of issues encountered and corrective actions include:

1. Certain procedures are frequently admitted after ambulatory surgery – through the CQI process, procedures that frequently required overnight admission were identified (sinus surgery, TUR bladder tumours), and through utilization review, the procedures are booked as a 23-h observation admission from the onset.
2. Procedures that are booked as possible extensive surgery are treated as an inpatient booking. This is done internally with the hospital, as many insurance carriers are inflexible in changing the admission status from ambulatory to inpatient. This results in better utilization of the ASU and anticipation of the need for inpatient beds.

Medical record documentation

A random sample of medical records are reviewed for clinical pertinence and supporting documentation. The criteria are established by the medical staff. However, many facilities are governed by the JCAHO, AAAHC and state agencies for their requirements of completed documentation (i.e. history and physical, appropriate laboratory testing, operative report, doctor's notes, discharge evaluation and instructions, etc). Additionally, requirements for reimbursement necessitate chart completion. This clinical indicator is dealt with by the Medical Records Department and reported upon monthly. Doctors are notified of the deficiencies in charting.

Freestanding ASU (adapted from Twersky (1992) and Twersky and Barlow (1991))

It is essential that a freestanding surgery centre QA programme be both comprehensive and streamlined to be compatible with the time restraints imposed by efficient staffing patterns. Just as with the hospital-integrated programme, it can be refined so that it is conducted and documented on a continual basis and requires only a monthly summary of the results to the CQI committee. Staff nurses assigned to each segment of the programme conduct the documentation and reporting of the monthly results. Elements of the

Table 3. CQI clinical indicators for free-standing ASU

Preoperative greeting and evaluation
Operating room (OR) procedures
Laser safety
Infection control
Postanaesthesia recovery
Pharmacy
Medical Records
Facility assessment
Anaesthesia quality assurance

programme are shown in Table 3. Many of the components of the CQI programme in the free-standing facility are not contained within the hospital-integrated clinical indicators, (i.e. operating room procedures, laser safety, pharmacy and facility assessment, anaesthesia quality assurance) and reflect the independent operation of the facility. Compliance in these areas is documented and trended.

Conclusion

Does a good CQI programme improve outcome? A large database of information would be required to reach a scientific conclusion and that is not currently available. It is desirable, through the CQI process, to collect more standardized information, that can be shared by different facilities as a benchmark for performance. However, even without the hard data, it is indisputable that maintaining patient safety by the use of monitoring and evaluation through CQI forms an integral part of the delivery of health care.

The success of the ASU CQI programme lies in its leaders seeking ways to improve patient care well beyond mere compliance with minimum standards. If anaesthesiologists, nurses, surgeons, ancillary staff and administrators work together to solve system problems, then it is to be hoped that improvement in patient care will occur. It is important that ASUs establish a well-defined CQI programme, so that it can respond to the changes that are expected to take place in the American healthcare system. The ASU CQI programme, regardless of whether hospital-integrated or free-standing, should have as its goal the desire to enhance the quality of care continuously.

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