

# QUALITY OF CARE IN ANAESTHESIOLOGY

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## INTRODUCTION

- Quality and safety are closely related to **consistency and reduction in practice variation**.
- The **advancements in anesthesia** techniques has **necessitated assurance of quality anesthesia services delivery**.
- In anaesthesia, **reducing the error rate** increases quality and reduces preventable injuries to patients, while also eliminating the additional costs resulting from those errors.
- The **objective** of quality assurance is to ensure a **high standard of anesthetic care with a focus on patient safety** during perioperative period.
- In the health care sector, quality can have various meanings to different people.

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- In order to help **standardize the definition** of quality in health care, the **Institute of Medicine (IOM)** published its own definition in a **1990 report titled Medicare: A Strategy for Quality Assurance**.
- **The IOM defined quality as** “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.”
- The IOM subsequently outlined **six dimensions or aims** of quality in its **2001 report**, Crossing the Quality Chasm.
- These aims have been adopted by many organizations, as a basis on which quality is evaluated and improved.

## 1) Safety -

- **No patient or health care worker should be harmed** by the health care system at any time, including during transitions of care and “off hours,” such as nights or weekends.
- As much as possible, **patients should be informed** about the risks and benefits of medical care in advance.
- If a complication does occur, medical staff should make **full disclosure**, provide assistance to the patient and family, and exercise due diligence in preventing any recurrences of the error

## 2) Effectiveness -

- **Evidence based decisions** about treatment for individual patients, when such evidence exists.

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- **Clinical expertise and patient values combined** in forming a treatment plan.
- With effective care, **underuse** and **overuse is avoided**.

## 3) Patient-centeredness –

- Catering to **individual patient preferences, needs and values** and uses these factors to guide clinical decisions.
- **Examples** of patient-centered care include –
  - ✓ Shared decision making.
  - ✓ Patient ownership of medical records.
  - ✓ Schedules that minimize patient inconvenience
  - ✓ Unrestricted visitation hours.

#### 4) Timeliness -

- **Reduced wait time** is important to both patients and health care practitioners.
- Delays may not only affect **patient** satisfaction, but may impair timely diagnosis and treatment.
- For **health care workers**, delays in availability of equipment or information may decrease job satisfaction and the ability to perform their jobs adequately.

#### 5) Efficiency –

- Improved efficiency **reduces waste and results in an increased output** for a given cost.

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- Examples of efficiency measures include mean length of hospital stay, readmission rate, and mean cost of treatment for a diagnosis.

#### 6) Equity –

- Equitable care does not vary in quality based on personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status.

# METHODS OF QUALITY ASSESSMENT

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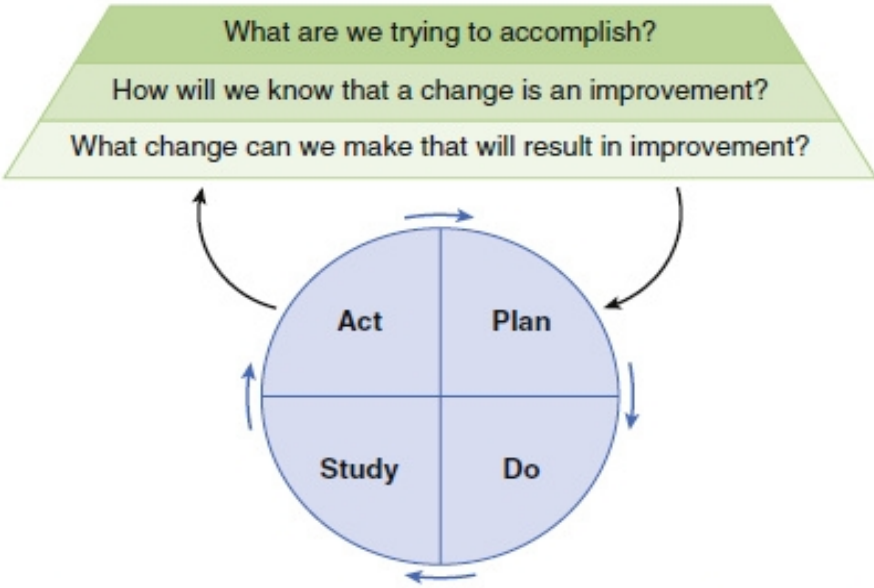
- **Numerous innovative efforts** have been made globally.
- In **1979**, **Joint Commission on Accreditation of Hospitals (JCAH)** introduced a **quality assurance standard**.
- In **2009**, **ASA** established the **Anesthesia Quality Institute**.
- A **change in the system or process** is required to reduce **unwanted variation** so that **random errors** will be less likely.
- **Following process** helps in achieving the goal:

- **Feedback** from patients and surgeons.
  - **Effective monitoring.**
  - **Data collection** methods should be meticulous.
- ✓ **Electronic medical records (EMR).**
  - ✓ **Anesthesia information management systems (AIMS).**

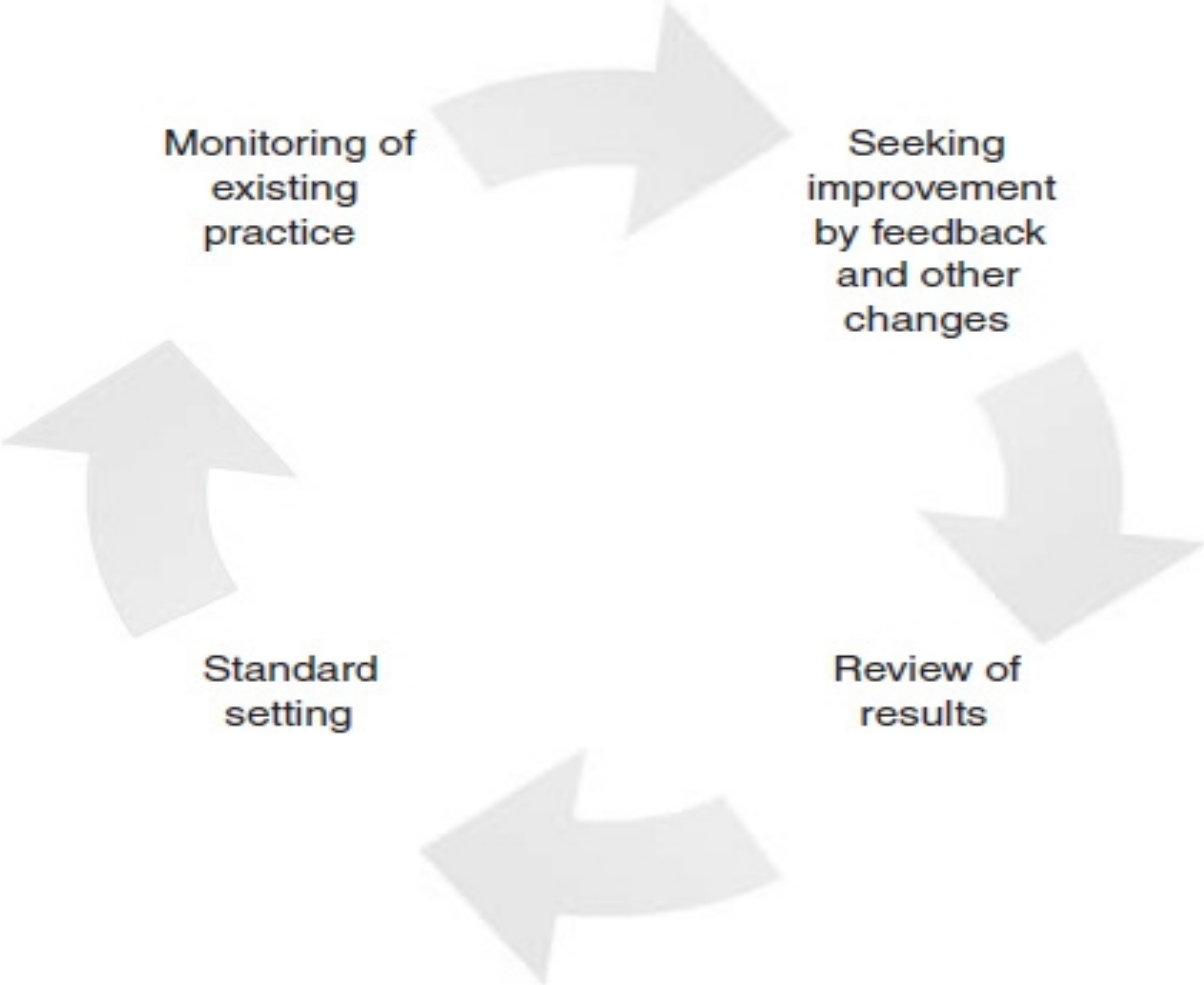
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TABLE 6-1 STEPS OF A PLAN, DO, STUDY, ACT (PDSA) CYCLE	
Step	Description
Plan	Make a plan for the test of change. Include predictions of results and how data will be collected.
Do	Test change on a small scale. Document data, observations, and problems that occur.
Study	Use data gathered from previous stages to build new knowledge and make predictions. Knowledge is gained from both successful and unsuccessful changes.
Act	Adopt the change, or use knowledge gained to plan or modify the next test of action.



**Figure 6-1.** Diagram of Model for Improvement. (From Langley



Sequence of events in a continuous quality improvement cycle.

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# METHODS OF QUALITY IMPROVEMENT

- **Multidisciplinary approach** - It involves:
  - ✓ Identifying **evidence-based interventions** associated with improved outcome.
  - ✓ Select **goal-oriented interventions** that have the biggest impact on outcomes.
  - ✓ Develop and implement **measures that evaluate** either the intervention or the outcomes.
  - ✓ **Measure baseline** performance.
  - ✓ **Administering the required interventions** through engagement, education, execution and evaluation.

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- **Comprehensive unit based safety program** - It is a **six step program** to improve the quality in intensive care units by learning from mistakes and improving culture –
  - ✓ **Measuring safety culture.**
  - ✓ **Presenting educational material.**
  - ✓ Forms to identify **patient safety** issues using **questionnaires.**
  - ✓ **Assigning a senior executive** responsible for a specific area.
  - ✓ Implementing **projects.**



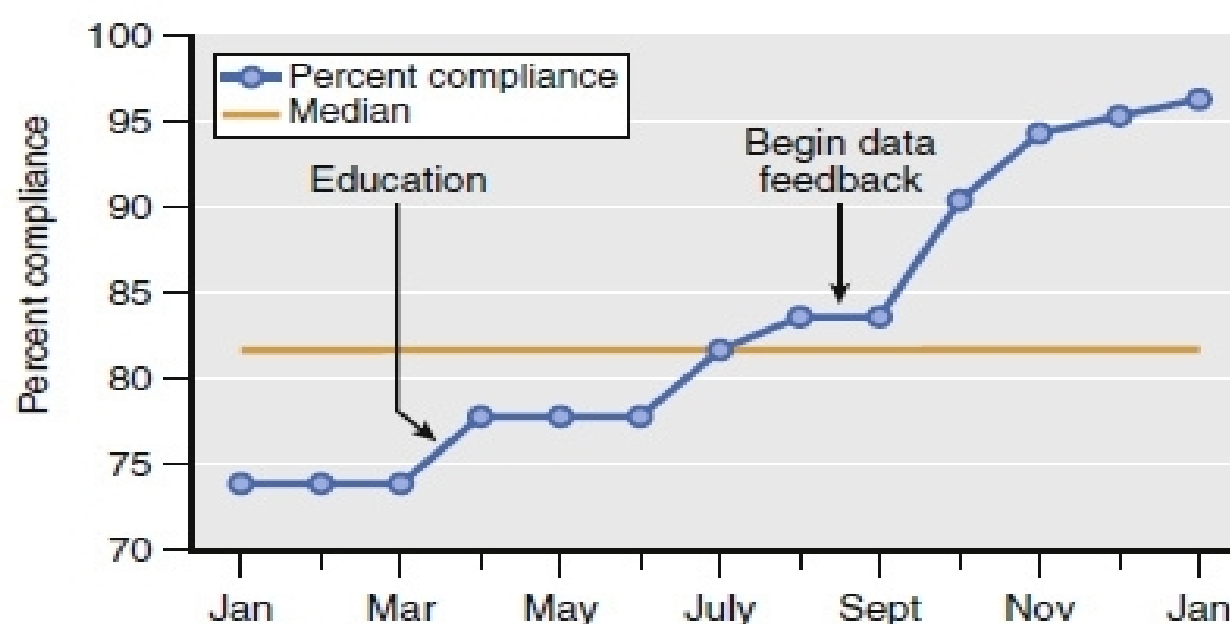
- **Quality measures should include the following –**
  - ✓ **Process measures** - that address the processes of health care delivery (e.g., perioperative  $\beta$ -adrenergic blocker administration for patients, antibiotic administration for prevention of surgical site infection).
  - ✓ **Outcome measures** - that address patient outcomes from delivery of these services, such as clinical and functional outcomes or satisfaction with services (e.g., morbidity, mortality, length of stay, quality of life, or perceptions of care).
  - ✓ **Balancing measures** - that address the possible consequences of changes in the process (e.g., when process improvements are made to improve efficiency, other outcomes, such as patient satisfaction, should not be adversely affected).

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- **For measurement to be effective, the following principles are important –**
  - ✓ **Simple, small-scale** measures that focus on the process itself and not on people.
  - ✓ **Practical**, seek usefulness not perfection and fit the work environment and cost constraints.
  - ✓ Data for **measurement should be easy** to obtain.
  - ✓ **Qualitative data** (e.g., reasons for patient dissatisfaction) are often highly informative and easy to obtain and should complement quantitative data (e.g., percentage of patients satisfied with care).
  - ✓ **Balanced set of measures** can help answer the question, Are we improving parts of our system at the expense of others?

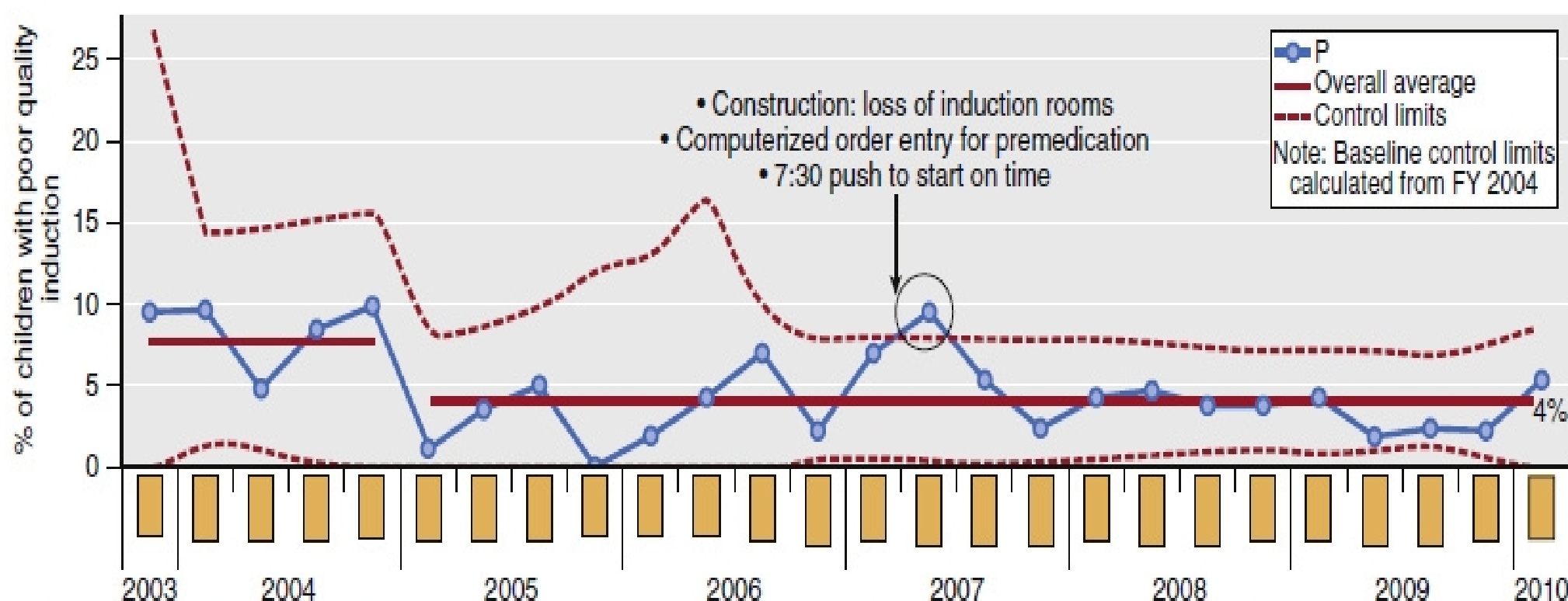
- **Run charts and control (Shewhart) charts** - These are graphic displays of data that enable observation of trends and patterns over time. They are the best tools for determining whether improvement strategies have had an effect.



**Figure 6-2.** Example of a run chart. This chart shows the plot of a performance measure over time. The horizontal (x) axis represents time in months, and the vertical (y) axis represents the performance measure—the percentage of compliance with the timing of preoperative antibiotics.

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**Figure 6-3.** Example of a control chart that monitors the quality of the anesthesia induction process, as measured by an induction compliance checklist. The solid red line marks the mean, and the dashed lines indicate the upper control limit (UCL) and lower control limit (LCL), which are  $\pm 3$  standard deviations from the mean. The circled point represents a single special cause variation in quality of induction. ICC, Induction Compliance Checklist score. (From Varughese AM: *Quality in pediatric anesthesia*, Paediatr Anaesth 20:684-696, 2010.)

- A **dashboard** of measures functions like an instrument panel for an aircraft or automobile and provides real-time feedback on what is happening.
- **Balanced scorecards** or “**whole system measures**” are similar to dashboards and are used to provide a complete picture of quality.
- **Flow charts / flow diagrams** identify and clarify all steps in the process.
- **Key Driver Diagram (KDD)** is another approach to organizing the theories and ideas for improvement that a team has developed.
- **Daily goal sheets** - A one-page checklist.

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**Figure 6-5.** Example of an intensive care unit (ICU) daily goals sheet. *CXR*, Chest radiograph; *d/c*, discharge; *DVT*, deep vein thrombosis; *EKG*, electrocardiogram; *GI*, gastrointestinal; *HOB*, head of bed; *HR*, heart rate; *ICUSRS*, ICU self-reporting system; *ND*, naso-duodenal; *NPO*, nothing by mouth; *OOB*, out of bed; *PEG*, percutaneous endoscopic gastrostomy; *PUD*, peptic ulcer disease; *RR*, respiratory rate; *SIRS*, severe infectious respiratory syndrome; temp, temperature; *TPN*, total parenteral nutrition; vent, ventilator; *WBC*, white blood cell count.

	Room Number _____	Shift: <input type="checkbox"/> AM / <input type="checkbox"/> PM
Safety	What needs to be done to d/c patient from the ICU?	
	Patient's greatest safety risk? How can we ↓ risk?	
	What events or deviations need to be reported? ICUSRS issues?	
Patient Care	Pain & Sedation Management	Pain goal ____ /10
	Cardiac Review ECGs	HR goal ____ <input type="checkbox"/> at goal <input type="checkbox"/> ↑ <input type="checkbox"/> ↓ β-blockade
	Volume status	Even <input type="checkbox"/> Pos <input type="checkbox"/> Neg ____ Net ____ (cc)
	Net goal for midnight	<input type="checkbox"/> Patient determined
	Pulmonary: Ventilator, ventilator bundle, HOB ↑, wean	<input type="checkbox"/> OOB/pulmonary toilet/ambulation
	SIRS/Infection/Sepsis evaluation Temp >38°C or <36°C; HR >90 RR >20 or Paco <sub>2</sub> <32 WBC >12000 < 4000 or >10% bands	<input type="checkbox"/> No current SIRS/sepsis issues <input type="checkbox"/> Known/suspected infection <input type="checkbox"/> Culture blood x2/urine/sputum <input type="checkbox"/> Antibiotic changes <input type="checkbox"/> Discontinue sepsis bundle
	Can catheters/tubes be removed?	Y/N
	GI/Nutrition/Bowel regimen: TPN catheter, ND tube PEG needed?	<input type="checkbox"/> TPN <input type="checkbox"/> NPO/Advance diet
	Is patient receiving DVT/PUD prophylaxis?	Y/N
	Can meds be discontinued, changed to PO, adjusted?	
To Do	Tests/Procedures today	
	Scheduled labs	
	AM labs needed/CXR?	
	Consultations	
Description	Has primary service been updated?	
	Has family been updated?	
	Social issues addressed?	
	Long-term/Palliative care	

- **Briefing and debriefing** tools are designed to promote effective interdisciplinary communication and teamwork.
  - ✓ A briefing is a structured review of the case at hand that takes place among all team members before the start of an operative procedure.
  - ✓ A debriefing occurs after the procedure; the team reviews what worked well, what failed, and what could be accomplished better in the future

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	<b>Briefing: Before Every Procedure</b>
	Team introductions: First and last names, including roles; write names on board
	Verify: Patient ID band, Informed Consent (read out loud), site marking, OR posting, patient's verbalization of procedure (if patient awake), H&P or clinic note
	Are there any safety, equipment, instrument, implant, or other concerns?
	Have antibiotics been given, if indicated?
	What are the anticipated times of antibiotic redosing?
	Is glucose control or $\beta$ -blockade indicated?
	Is the patient positioned to minimize injury?
	Has the prep solution been applied properly, without pooling, and allowed to dry?
	Have the goals and critical steps of the procedure been discussed?
	Is the appropriate amount of blood available?
	Is DVT prophylaxis indicated? If yes, describe.
	Are warmers on the patient?
	Is the time allotted for this procedure an accurate estimate?
	Have the attendings reviewed the latest laboratory and radiology results?
	<b>Debriefing: After Every Procedure</b>
	Could anything have been done to make this case safer or more efficient?
	Has the Surgical Site Infection data collection form been completed?
	Are the patient's name, history number, surgical specimen name, and laterality on the paper work? (must be independently verified by the surgeon)
	Did we have problems with instruments? Were they reported?
	Plan for transition of care to postop unit discussed? <input type="checkbox"/> Fluid management? <input type="checkbox"/> Blood transfusion paperwork in chart? <input type="checkbox"/> Antibiotic dose and interval to be continued postop? <input type="checkbox"/> Pain management/PCA plan? <input type="checkbox"/> New medications needed immediately postop? <input type="checkbox"/> $\beta$ -blockers needed? <input type="checkbox"/> Glucose control? <input type="checkbox"/> DVT prophylaxis?

**Figure 6-6.** Example of an operating room briefing and debriefing tool. DVT, Deep vein thrombosis; H&P, history and physical; ID, identification.



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THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.

# SOURCES OF QUALITY IMPROVEMENT INFORMATION

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- **Incident reporting –**

- ✓ Voluntary incident reporting provides the potential to also learn from near misses—incidents that did not lead to harm but were potentially hazardous.
- ✓ Reporting systems that have been developed –
  - **Anesthesia Incident Reporting System (AIRS) created by AQI**  
([www.aqihq.org/airs/airsIntro.aspx](http://www.aqihq.org/airs/airsIntro.aspx)).
  - **United Kingdom's** Serious Incident Reporting and Learning Framework
  - **Australian** Incident Monitoring Study.
- ✓ **Many events and near misses still frequently go unreported.**

✓ One way to capture these incidents is to survey local medical staff members.

• **Published Literatures –**

✓ Literature reviews offer ideas for QI topics in specific areas and information to guide interventions.

• **National Initiative and Quality Matrix (NIQM) –**

✓ National professional organizations, such as the American Society of Anesthesiologists (ASA) and the Society for Critical Care Medicine (SCCM), offer guidelines specific to the field.

✓ These guidelines cover a range of practices.

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TABLE 6-3 NONPROFIT AND GOVERNMENTAL QUALITY IMPROVEMENT ORGANIZATIONS PERTINENT TO ANESTHESIA		
Quality Improvement Organization	Website	Description
Agency for Healthcare Research and Quality (AHRQ)	<a href="http://www.ahrq.gov">www.ahrq.gov</a>	Lead federal agency charged with improving the quality, safety, efficiency, and effectiveness of health care
American Health Quality Association (AHQA)	<a href="http://www.ahqa.org">www.ahqa.org</a>	Represents quality improvement organizations and professionals working to improve the quality of health care
Anesthesia Patient Safety Foundation (APSF)	<a href="http://www.apsf.org">www.apsf.org</a>	Promotes investigations and programs that will provide a better understanding of anesthetic injuries
Centers for Disease Control (CDC)	<a href="http://www.cdc.gov">www.cdc.gov</a>	One of the major operating components of the U.S. Department of Health and Human Services
Emergency Care Research Institute (ECRI)	<a href="http://www.ecri.org">www.ecri.org</a>	Uses applied scientific research to discover which medical procedures, devices, drugs, and processes are best
Institute for Healthcare Improvement (IHI)	<a href="http://www.ihl.org">www.ihl.org</a>	Health care improvement organization based in Cambridge, Massachusetts
Institute for Safe Medication Practices (ISMP)	<a href="http://www.ismp.org">www.ismp.org</a>	The nation's only 501(c)(3) organization devoted entirely to medication error prevention and safe medication use
Medicare Quality Improvement Community (MedQIC)	<a href="http://www.medquic.org">www.medquic.org</a>	A national knowledge forum for health care and quality improvement professionals
National Quality Forum	<a href="http://www.qualityforum.org">www.qualityforum.org</a>	Created to develop and implement a national strategy for health care quality and reporting
National Patient Safety Foundation (NPSF)	<a href="http://www.npsf.org">www.npsf.org</a>	An independent 501(c)(3) organization with a mission to improve the safety of patients

- **Outcomes Research –**

- ✓ Outcomes research offers a potential to identify variations in care and to determine whether they improve outcomes for patients undergoing anesthesia.

- **Internal or external institutional reviews -**

- **Private insurers –**

- ✓ Many private insurers now collect data on certain quality elements.
- ✓ The Leapfrog group is one such entity.
- ✓ **Performance-based payments**, are being introduced as a means of improving quality.

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- ✓ **Pay for performance (P4P)** refers to financial incentives that reward practitioners for the achievement of a range of payer objectives.
- ✓ Measures that are incorporated into P4P and performance-based measures must be **evidence-based, consistent with national goals, or based on consensus** in the absence of evidence.
- ✓ Measures must be reliable, valid, and feasible and that the programs be **voluntary**.
- ✓ **The PQRS (Physician Quality Reporting System)** is a reporting program that uses a combination of incentive payments and payment adjustments to promote reporting of quality information by eligible professionals.



## COLLABORATIVE PROGRAMS

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- **Participation of two or more health care teams** working toward a shared goal.
- **Single organization and/or across multiple health care organizations.**
- **Multidisciplinary representatives.**
- Collaboratives bring a **shared momentum and enthusiasm** that can increase sustainability.
- Includes two process –
  - ✓ **Evidence-based interventions.**
  - ✓ **Data collection.**

- **Element to the success** of collaborative programmes are –
  - ✓ Educating members.
  - ✓ Group discussions.

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## INDICATORS FOR QUALITY OF ANAESTHETIC CARE

- **Define and delineate the various indicators or parameters of care.**
- The improvement in quality of anesthesia services can be brought about by following measures, which may include but are not limited to –
  - ✓ **Adequacy of the pre-anesthesia evaluation.**
  - ✓ **Perioperative adequacy/quality of anesthesia services** - observing and recording any adverse event such as –
    - Broken tooth,
    - Need for re-intubation and complications during difficult airway management,
    - Identification and management of cardiac and other complications related to co-morbid diseases, fluid overload and many others.

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- **Post-operative adequacy/quality during recovery and discharge** may be evaluated by assessing post-surgical complications such as –
  - ✓ Hypotensive episodes,
  - ✓ Arrhythmias,
  - ✓ Respiratory complications,
  - ✓ Intake-output ratio,
  - ✓ Temperature fluctuations,
  - ✓ Causes for any prolonged stay in the recovery room.

- **Perception of anaesthesia quality: patient's perspective –**
  - ✓ **Post-operative nausea and vomiting and post-operative pain** are considered the two most important parameters for assessment of quality of recovery during the post-operative period.
  - ✓ **Pain** in post-anesthesia care unit **can be measured by using a variety of scales** such as visual analog scale, numerical rating scale, verbal rating scale and behavioral scale, which is a matter of subjective comfort.
  - ✓ **Different techniques for prevention of nausea and vomiting, and providing analgesia.**

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## CHALLENGES AND BARRIERS TO QUALITY IMPROVEMENT

- Multicentered and/or single-hospital projects **can fail because of** –
  - ✓ Inadequate resources.
  - ✓ Lack of leadership support.
  - ✓ Vague expectations and objectives for team members.
  - ✓ Poor communication.
  - ✓ Complex study plans.
  - ✓ Inadequate management of data collection.
  - ✓ Wasted efforts to “reinvent the wheel” rather than adopting practices proven to be effective.
  - ✓ Local culture that is not ready for change.