Revista Mexicana de Anestesiología

CONFERENCIAS MAGISTRALES
Vol. 29. Supl. 1, Abril-Junio 2006
pp S83-S88

What should anesthesiologists know about operating room management

Vinod Malhorta, M.D.*

* Department of Anesthesiology, Weill Cornell Medical College, New York Presbyterian Hospital, New York, NY

INTRODUCTION

Effective management of the operating rooms requires establishment of systems and processes that are efficient, consistent, fair and that can be monitored and measured for performance. These should be cost effective and should maximize revenues. To effect changes leadership, shared vision, team enhancement and consensus building are a must along with ambitious but realistic expectations.

ESTABLISH GOALS AND OBJECTIVES

Primary objectives of effective OR management are threefold: 1) provide best possible patient care and a pleasant workplace, thus improving satisfaction among patients, staff, and surgeons, 2) increase market share, attract new business, negotiate better contracts, and the bill and collect efficiently to enhance revenues, and 3) to decrease costs by efficient OR utilization, and effective staff and materials management.

PROVIDE LEADERSHIP

- OR manager must be a senior level executive who has first hand experience and an intimate knowledge of OR setting, experience in administration, knowledge of information systems, and preferably some training in business management. An effective manager will display leadership qualities, organizational skills, flexibility and receptiveness to new ideas, interpersonal skills and skills in conflict resolution.
- Anesthesiologists have a presence in the OR and have the best understanding of the complete perioperative process. They can make decisions that need to be based on medical judgment, the knowledge of surgery and individual surgeons. Further, in most hospitals, anesthesiologists who are seen as facilitators and have leadership skills already function as clinical directors and can be readily recruited into this role. According to a survey conducted by the American Association of Clinical Directors (AACD) in 2002, 71% of the respondents reported that an anesthesiologist was designated as the clinical director of the ORs.

CREATE JOB DESCRIPTION AND ORGANIZATION

- Responsibilities of the OR manager or Medical Director of Perioperative Services (MDPS) will include Fiscal Management (budgets, costs, revenues), Materials Management (equipment, supplies, waste), Personnel Management (OR Constituents, RR, CSR), establishing Policy and Procedures, providing a safe and pleasant workplace and Strategic Planning.
- OR constituents that the MDPS would likely oversee are the surgeons, anesthesiologists, nurses, administrators, OR technicians, CRNA's, PA's, residents, anesthesia technicians, laboratory personnel, housekeeping, schedulers, and admitting services.
- The OR manager will chair or serve on the OR committee.
- He/she will be responsible for monthly/quarterly/yearly reports, allocation and reallocation of block time and effective OR resource utilization.
- To be effective, the OR manager must have commitment from the hospital, obtain cooperation between anesthesiologists, surgeons and nursing and report directly to the hospital CEO/COO/CMO. OR constituents should report to him.

NEGOTIATE COMPENSATION FOR THE OR MANAGER

Growing number of physicians are receiving compensation from hospitals or multi specialty groups for serving as OR

directors although database of such compensation is scant at best. The compensation may be in the form of a salary or a salary plus bonus, and is often prorated for those contributing less than 100% of their time to this effort. According to the previously mentioned survey conducted by AACD in 2002, only 4% of respondents received a stipend more than $50,000 per year while 40% did not receive any. Less than 5% controlled OR Budget and only 22% controlled OR scheduling. A survey conducted by The American College of Physician Executives in 2003 reported an increase in executive physician pay at all levels and mostly as incentives or bonuses, but noticeably absent in the survey were operating room managers. Nurses who are OR managers reported a median annual income of $85,000 in 2004

OPERATIONAL ISSUES

Create a realistic elective schedule

Elective OR schedule is the template on which the OR functions are based. An accurate real time based schedule helps predict staffing, availability of equipment, and correct instruments, and results in a smooth running OR. An inaccurate schedule that is frequently changed and tampered with additions, cancellations, and substitutions on the day of surgery sends the entire system into disarray and is very costly.

- Block scheduling allows predictability in OR schedule and review of utilization of the allotted time.
- Allocation of Blocks: Historic data should be reviewed with surgeons, staff and OR committee to determine accuracy. Conflicts should be resolved by the OR Director through discussion. Blocks should be readjusted periodically based on needs.
- Block Release Time: at an agreed upon time (48-72 hrs in most hospitals and longer in ambulatory surgery centers, surgi centers) prior to date of surgery, the blocked time should be released.
- An accurate schedule must list accurate and realistic start time and end time for each case based on historic data that is constantly updated. Additional procedure/surgeons should be listed. Cases should not be booked "to follow".
- Scheduling requires a knowledgeable OR scheduler and scheduling software that is easy to use, has visual grids, can list multiple procedure and can be customized.

PREPARE ON THE DAY BEFORE SURGERY

- The schedule should be reviewed by the OR director, clinical director of anesthesiology, and the head nurse of the OR. Errors can be rectified and potential problems identified at this time including rooms that will run late, the need for OR staff after 3PM or 5PM and potential gaps where add-on cases can be accommodated. The OR list can be used to order supplies and instrument trays the night before surgery.
- The documentation must be complete the day before surgery. Incomplete paperwork is the commonest cause of morning delays in the operating room in most institutions. Adopt a policy that any case with incomplete documentation the day before surgery will not be booked as the first case in any operating room.
- Eliminate unnecessary laboratory tests and consolidate paperwork.

GETTING THE SCHEDULE DONE – DAY OF SURGERY

Protect The Elective Schedule Keep It Predictable and Reduce Variability

Some institutions set aside one or two rooms for add-ons and emergencies. This strategy works if add-ons and emergencies will predictably allow utilization of these rooms effectively. In this case, the emergencies get priority and add-ons are booked on a first come-first served basis.

Most institutions, however, cannot afford to have one or two operating rooms staffed and waiting. In this case a clear algorithm must be developed. Emergencies and elective add-ons are fairly straightforward to deal with. Any emergency goes to the first available room whereas and elective add-on case goes at the end of the schedule. It is in the case of the so-called "urgent" case that a decision needs to be made on a case to case basis. Examples of this type of case include an ectopic pregnancy, an obstructed bowel, a fracture and an eye injury. Each of the services must be asked to develop guidelines regarding urgency and maximum allowable wait times before surgery for these cases. This information should be common knowledge at the OR desk. This will allow appropriate triage of cases should it become necessary to insert the urgent cases ahead of an elective scheduled case. Author suggests an algorithm that is both fair and effective, the so called 'bumping policy.

BUMPING POLICY

If a surgeon needs to bump a scheduled case for urgent surgery the sequence of selection of the bumped case is: own case → partner's case → same service case → other case after discussion with the other surgeon.

START ON-TIME

The start time should be defined as the time when patient arrives in the OR and is placed on the operating table.

The aim should be 90% on-time start for the first cases, and 80% or better for second cases. The morning start sets the pace for the room for the rest of the day. It is not uncommon for a 15-minute delay in the morning to end up with an hour and a half of delays by the end of the day. Following is suggested to ensure on time starts.

- The patients should have been given appropriately early time for arrival the night before.
- "One-stop check in". The patient admission should be completely processed in one place by the nurse or physician assistant. Avoid patient and paperwork transfers.
- Recruit nurses from the PACU to facilitate admission of first cases.
- Bring the patient directly to the operating room. Bypass holding area. The holding area is good for subsequent cases or placement of epidurals for pain. For most cases, arterial lines and CVP's, etc., can be placed in the operating room while the urinary catheter is inserted and operative site is prepared.
- Anesthesiologist, nurses, and surgeons should be working in parallel to improve efficiency and not in series as is frequently the case.

KEEP TURNAROUND TIMES SHORT (CRITICAL IN ROOMS WITH MULTIPLE TURNOVER)

Turnaround time (TAT) should be kept at the minimum. It is suggested that TAT for inpatient ORs should be 30 minutes while TAT for ambulatory centers be 15 minutes or less. For minor cases it could be 5-10 minutes. To minimize the TAT, patient preparation for the following case must begin in the preoperative holding area. Intravenous catheter can be placed and an infusion started. Prophylactic antibiotics can be given. Placement of arterial cannula, central venous catheter, Swan-Ganz catheter, and epidural catheter to provide anesthesia for surgery or for pain management can be accomplished in the holding area. Instrument trays can be prepared and ready outside the room to be opened during the turnaround time. Delays in turnaround must be examined and the causative factors remedied.

A clear definition of turnaround time should be adopted. Turnaround time is defined as the interval between the previous patient's departure from the OR to the next patient's arrival in the OR.

DECREASE CASE TIMES (BEST YIELDS ARE IN COMPLEX INPATIENT SURGERIES)

While avoiding morning delays and maintaining low turnaround times is important for effective running of the schedule, intraoperative delays can wreak havoc on the daily conduct of the OR schedule. A 2 hour case that takes 4 hours will not only delay the subsequent cases, but may result in cases being put on hold. Longer than acceptable case times may be the result of:

- Slow induction of anesthesia
- Long patient preparation time
- Slow surgery (slow surgeon, attending surgeon not present for long sections of the case, too much teaching)
- Delayed emergence from anesthesia
- No PACU beds available

AVOID ORs ON HOLD

Operating rooms that are placed on hold result in a costly waste of time. Ensure availability of

• Surgeon • Anesthesiologist • Nurses • Equipment • PACU beds

The surgeon's office must be notified well ahead of time regarding his case. Should the surgeon be unavailable, another case can be substituted in that slot. Anesthesia coverage needs should be anticipated and adjustments made as necessary.

Nursing coverage beyond 3PM and 5PM is generally a problem. There exists a shortage of OR nurses in the United States and it is expected to grow in the next 5 years. For some hospitals, flexible staffing of the OR may help address this problem. The nurses are routinely requested to put in overtime to get the cases done. Overtime is an expensive way to staff the OR. The ratio of registered nurses and OR technicians may have to be adjusted during the day to provide coverage.

Equipment non-availability (e.g., microscopes, laparoscope, laser) is generally preempted by rearranging the OR schedule ahead of time. However, if a case takes unexpectedly long, the equipment may not be available for another case. Rearranging the order of a surgeon's own cases may be the easiest, and least disruptive solution to this problem. Once again, a morning review of the schedule should alert the OR director of this possibility. The patients to follow can then be called in time to come earlier than planned allowing for rearranging of cases.

Occasionally the PACU is full and there are no beds available for discharging patients from the OR. To prevent this problem, a review of the schedule with the PACU head nurse must be done in the morning to anticipate the extent of this problem, which usually occurs in late morning and afternoon, and plan PACU discharge strategy for the day. All patients who have met PACU discharge criteria must be discharged promptly. All patients planned for transfer to ICU postoperatively should bypass the PACU. Every once in a while, the

hospital beds are full so that the PACU patients cannot be discharged to a hospital bed causing a back up in the PACU. In such instances, we have found it useful to transfer these patients to the holding area where one nurse can monitor up to 8 patients who are ward-ready. This frees up beds in the PACU. Beyond this, the hospital admissions office and a hospital administrator must be consulted and if it is likely that no more beds will be available, some of the OR list will have to be postponed. It is much better to make this decision early so that the patients can be informed before they leave home and the surgeons can be informed in time.

PACU discharge criteria should be established to allow faster passage through PACU. For patients who meet PACU discharge criteria upon emergence in the OR, PACU can be bypassed.

DATA MANAGEMENT

- OR Management should be data driven and evidence-based. The data should be accurate, relevant and timely. The only thing worse than having "no data" is having "incorrect data". Avoid the pitfall of implementing corrective policy based on inaccurately interpreted data. Identify source of data and check assumptions made in calculations. Check raw data if necessary.
- Operational Data that should be reported monthly includes: on-time starts; turn around times; case times actual versus scheduled; cancellation rates; emergency and add-ons/by service/surgeon; room utilization/rooms running report; OR utilization; block utilization by service/surgeon; out of block surgery by service/surgeon and staff utilization and overtime.

FINANCE

Reduce costs of staffing and supplies

- Plan appropriate and flexible staffing; reduce overtime.
- Decrease inventory and standardize equipment
- Reduce waste of equipment and supplies

"Allocating money and resources to improve and advance your facility is not cost, it is investment."

ENHANCE REVENUES

- Increase OR cases by improving satisfaction and generating new business.
- Improve payer mix by effective recruitment and negotiated contracts.
- Improve billing, coding and collection for existing business.
- Monitor the contribution margins for surgeons, surgical procedures and services.

QUALITY IMPROVEMENT

- Monitor accuracy of start times (1st/subsequent cases); turnover times; ORs on hold; cancellation on day of surgery; periop length of stay; satisfaction of patients, surgeons, and staff.
- Track inappropriate admissions, perioperative tests, C-sections, surgery (terminal/DNR patients), wait time for patients, wait time for surgeons, inventory, and equipment.
- Benchmarking is a useful tool for quality improvement; sources include private companies, consultant groups, insurers, and operating room management outfits.
- Use internal benchmarking
- Monitor equipment use; document waste; monitor use vs. charge capture.
- Use Community standards and share experience with other hospitals; case duration in comparable hospitals; cost per case in local area; define common problems; develop joint projects.
- Use uniform performance improvement methodology: PRIDE; PDCA; 10 steps; CQI, Six Sigma.

INFORMATION SYSTEMS (IS)

Before investing in a new IS, list all functions that you need. IS should provide:

- Time base scheduling that allows customization and is user friendly.
- Clinical information, including PAT, anesthesia charting, intraop nursing record.
- Patient tracking (workflow), OR utilization.
- Interfacing with coding and billing accounting, medical records, pharmacy, laboratories, materials management, QA.

SATISFACTION
SURVEYS – PATIENT/EMPLOYEE/SURGEONS

Information sought should be carefully determined, survey methodology should be adhere to standards, expert help should be obtained, and information obtained should be critically examined. Pilot surveys may be necessary

TOP FIVE ATTRIBUTES FOR SURGEON SATISFACTION

- On-time starts
- Short turnaround time

- Anesthesia availability
- Quality anesthesia providers
- Good equipment

TOP FIVE ATTRIBUTES FOR PATIENT SATISFACTION

- On-time starts
- Intravenous catheter placement – quick, easy, with minimal pain
- No postoperative nausea
- Adequate pain control
- Surgeon's postoperative visit to the family

TOP FIVE ATTRIBUTES FOR EMPLOYEE SATISFACTION

- Professional respect
- Employee recognition
- Friendly workplace environment
- Effective communication
- Partnership in performance

According to the surveys conducted by HR Solutions®, the average overall job satisfaction rate among healthcare employees is 65% for 29 academic teaching hospitals and 70% for 445 health care organizations surveyed. Among nurses, even though the median salaries increased 8.1% in 2002 the morale and work satisfaction continues to decline. "You cannot pay professionals enough to stay in an environment they don't enjoy."

MANPOWER SHORTAGE IN OR PERSONNEL

There exists presently a shortage of

- Anesthesiologists (estimated 1100-3800) *A&A 2003
- CRNA (salaries increased 16-20%) FASA 2001/2002
- Nurses (average age 49, unfilled rate 8-20%) NYT 4-8-01
- OR Technicians
- Surgeons - projected (residency fill rate 76% - 2005) AAMC

Creating a pleasant work environment should be the foremost goal of the OR leadership to retain and recruit professional staff. "Sign on bonuses" is a tempting quick fix. It encourages a mindset to leave as soon as a better offer comes along.

NATIONAL PATIENT SAFETY GOALS 2006

- Improve the accuracy of patient identification
- Improve effectiveness of communication among caregivers
- Improve safety of using medications
- Reduce the risk of health care-associated infections
- Accurately and completely reconcile medications across continuum of care
- Reduce the risk of patient harm resulting from falls
- Patient care handoffs

RESOURCES FOR TRAINING & INFORMATION

1. American Society of Anesthesiologists Certificate in Business Administration
2. American College of Physician Executives
3. American Association of Clinical Directors
4. Gabel RA, Kulli JC, et al (eds). Operating room management. Boston: Butterworth, Heinemann, 1999. ISBN: 0-7506-9911-6.
5. Harris PA, Zitzman WG (eds). Operating room management: structure, strategies and economics. Mosby-Year Book. ISBN: 0-8151-4178-5
6. OR Manager - monthly newsletter, Boulder, CO.
7. Journal of Clinical Anesthesia – The official journal of the Association of Anesthesia Clinical Directors. New York NY, 2003.
8. Anesthesia and Analgesia published articles under Featured section: Economics and health systems research.
9. Outpatient Surgery – monthly publication by Herrin Publishing, Paoli, PA.

APPENDIX

PROCEDURAL TIMES GLOSSARY© (For complete listing: www.AACDhq.org)

Anesthesia Start (AS) = Time when a member of the anesthesia team begins preparing the patient for an anesthetic.

Room Ready (RR) = Time when room is cleaned and supplies and equipment

necessary for beginning of next case are present.

Patient In Room (PIR) = Time when patient enters the OR/PR.

Procedure/Surgery Start Time (PST) = Time the procedure is begun (e.g., incision for a surgical procedure, insertion of scope for a diagnostic procedure, beginning of exam for an EUA, shooting of X-ray for radiological procedure).

Procedure/Surgery Finish (PF) = Time when all instrument and sponge counts are completed and verified as correct; all post-op radiological studies to be done in the OR/PR are completed; all dressings and drains are secured; and the physician/surgeons have completed all procedure related activities on the patient.

Patient Out of Room (POR) = Time at which patient leaves OR/PR.

Room Clean-up Start (RCS) = Time housekeeping or room personnel begin cleanup of OR/PR.

Arrival in PACU/ICU (APACU) = Time of patient arrival in PACU or ICU.

Anesthesia Finish (AF) = Time at which anesthesiologist turns over care of the patient to a post anesthesia care team (either PACU or ICU).

Room Clean-up Finished (RCF) = Time OR/PR is clean and ready for setup of supplies and equipment for the next case.

Ready-for-Discharge from Post Anesthesia Care Unit (RDPACU) = Time that patient is assessed to be ready for discharge from the PACU.

Discharge from Post Anesthesia Care Unit (DPACU) = Time patient is transported out of PACU.

Ready-for-Discharge from Same Day Surgery Recovery Unit (RDSDSR) = Time that patient is assessed to be ready for discharge from the Same Day Surgery Recovery Unit.

Discharge from Same Day Surgery Recovery Unit (DSDSR) = Time patient leaves SDSR unit (either to home or other facility).

Average Case Length (ACL) = Total Hours divided by total number of cases performed within those hours.

Case Time (CT) = Time from Room Set-up Start to Room Clean-up Finished.

Open Time (OT) = Hours of OR/PR time not reserved for any particular Service, into which any Service or physician/surgeon may schedule according to the rules established by the given institution.

Start Time (ST) Patient In Room Time.

Turnover Time (TOT) = Time from prior Patient Out of Room to succeeding Patient In Room Time for sequentially scheduled cases.

Adjusted-Percent Service Utilization (ASU) = (IBH + OBH) x 100 ÷ BT. This measures the percentage of time a Service utilizes their Block Time during Resource Hours. It is adjusted, compared to Raw Utilization, in that it gives a Service "credit" for the time necessary to set-up and clean-up a room, during which time a patient can not be in the room. It may exceed 100% because of the inclusion of cases performed during Resource Hours that are Outside-own Block Hours.

Adjusted-Percent Utilized Resource Hours (AURH) = (Total Hours -Evening/Weekend/Holiday Hours) ÷ Resource Hours x 100. This calculation provides the percentage of time that the OR/PR's are being prepared for a patient, are occupied by a patient, or are being cleaned after taking care of a patient during Resource Hours. It is adjusted, compared to Raw Utilization, in that it includes the time necessary to set-up and clean-up a room, during which time a patient can not be in the room.

Raw Utilization (RU) = For the system as a whole, this is the percent of time that

patients are in the room during Resource Hours.