Ambulatory surgery rates have steadily increased around the world. In the United States, ambulatory surgical centers (ASCs) have seen a growth from only 2 in 1970 to 1556 in 1991.[1] Between 2004 and 2009, the number of Medicare-certified ASCs increased by 28%, growing from 4106 to 5260. Furthermore, the number of Medicare-certified ASCs grew by an average annual rate of 3.6% from 2006 through 2010.[2] This growth has been driven by improved patient safety outcomes, socioeconomic advantages, and increased patient and surgeon convenience. Studies have shown improved patient satisfaction, greater scheduling flexibility, lower morbidity and mortality, lower incidence of nosocomial infection, less dependency on hospital beds, less cognitive dysfunction, greater efficiency, and lower overall procedural costs with ambulatory surgery.[3]

As medical costs rise in the United States, third-party payers and the government are looking for cost-effective strategies to provide more economic healthcare. Physicians are also seeking facilities that provide modern equipment, easy access, and more personalized care for their patients. As the spectrum of surgeries performed in the ambulatory setting broadens, and patient complexity continues to increase, the adherence to guidelines set by the American Society of Anesthesiologists (ASA) as well as the Society of Ambulatory Anesthesia (SAMBA) is paramount. The advantages to ambulatory surgery must be coupled with a zero tolerance for mortality and severe morbidity. These are realistic goals; in two major surveys of a total of 85,000 patients from Denmark, the mortality and severe morbidity rates caused by ambulatory surgery per se were zero. As the envelope is continually being pushed, patient safety must remain a top priority.

**Definitions**

Ambulatory anesthesia can be defined as an anesthesiology subspecialty encompassing the preoperative, intraoperative, and postoperative anesthetic care of patients undergoing elective, same-day surgical procedures. This definition is focusing on length of hospital stay and the need for anesthetic care. Ambulatory care is different from inpatient care, as the latter is usually defined in any patient staying one or more nights in hospital.

In the US, in contrast to the rest of the world, the Centers for Medicare and Medicaid Services (CMS) State Operations Manual states that “patients admitted to an Ambulatory Surgical Center will be permitted to stay [no longer than] 23 hours and 59 minutes starting from the time of admission [to the time of discharge] after the surgical procedure”.[4] Although a patient may have a 23-hour perioperative stay and still be considered “ambulatory,” this black and white designation should not obscure the underlying goal of careful patient selection that ensures simple postoperative medical management at home without complications requiring intensive physician or nursing management. The goal of ambulatory surgery is to have the patient ready for discharge to a setting without healthcare staffing within the scope of a single workday. Hotel or hospital-hotel stay can be classified as “ambulatory” as long as dedicated healthcare staffing is not needed to routinely monitor the patient. Having a backup service, such as a receptionist or even a nurse when requested falls within the ambulatory concept.

Ambulatory anesthesia can also further be categorized into four types, according to the type of organization:[5]
1842. As the use of anesthetics in surgical procedures grew over the years, so did the integration of anesthesiology within office-based surgical practice. Ralph Waters pioneered the utilization of a dedicated anesthesiologist in the office setting in 1919, which encompassed not only the delivery of anesthetics but also the organization of operating room and recovery room resources. His anesthetic practice, the Downtown Anesthesia Clinic (Sioux City, Iowa), responded to calls from healthcare providers such as dentists, and provided an operating room as well as a waiting room and small cot for recovery. Decades later in 1968, an office-based anesthesia facility at the Dudley Street Facility (Providence, Rhode Island) attempted to incorporate a medical office building along with an operating suite with complete operating room facilities and recovery room. However, this setup was not supported by the state’s regulatory agencies, which deemed the institution as simply another doctor’s office. Shortly after, in 1969, Wallace Reed and John Ford established a free-standing ambulatory surgical center in Phoenix, Arizona, where they proved that minor surgical procedures could be completed successfully and more economically compared to hospital-based minor surgeries.

Paving the way for office-based surgery and anesthesia

Within the last 200 years, the above-mentioned pioneers have laid the foundation for the mobilization of anesthesia delivery. As technology advances and the discovery of shorter-acting anesthetics with decreased side effects continues, the context in which an anesthetic can be safely and efficiently administered will continue to expand. A nice example of this is office-based anesthesia. Office-based anesthesia is a rapidly growing practice and subset of ambulatory surgery in which the operating suite is managed in conjunction with the physician’s office. Although the concept of modern-day office-based anesthesia is relatively new in the United States, a model for office-based dental anesthesia has been in place for many decades in the United Kingdom, and has proven to be safe and successful. Currently, about 20% of outpatient surgical procedures in the US are performed in the office.

Safety guidelines and checklists for the perioperative management of patients in the office setting have been extended from those made for free-standing ambulatory surgery centers. Office-based surgery practice guidelines have been established by the American Society of Anesthesiologists (ASA), the American Association of Nurse Anesthetists (AANA) and the The Joint Commission (TJC).

Furthermore, checklists have been developed to ensure the safe practice of office-based anesthesia. These checklists incorporate verification of the facility (i.e., building codes, recovery area, backup power), equipment availability (i.e., backup oxygen source, Ambu-bag, emergency crash cart, patient monitors) and general preparedness (ACLS-trained staff, licensed medical doctors, quality assurance policies).

The recent surge of ambulatory and office-based anesthesia centers is a testament to the feasibility of applying safe anesthetic practice to satellite locations outside of the hospital, and the increasingly “portable” nature of anesthetic delivery. However, this portability will require due diligence in assuring strict safety measures and quality control. There should also be zero tolerance for mortality and severe morbidity.

Zero tolerance for mortality/severe morbidity

When discussing the practicality of ambulatory anesthesia, as well as office-based anesthesia, it is important to touch upon the advantages and
disadvantages from the perspective of: (1) safety; (2) quality; (3) economics; and (4) education and staff satisfaction.

Ambulatory surgery requires an established infrastructure within the ambulatory unit that demands a disciplined and efficient team effort. The healthcare staff needs to adopt new routines and tighter schedules, the patients need to be well informed and the surgical and anesthesia-related procedures may need to be modified to accommodate same-day discharge. The backup systems outside the hospital such as phone access, road communication, ambulance systems, and well-informed chaperones need to be functional and dependable. Adequate staffing of the recovery room is vital to a successful ambulatory surgical center, and this may be susceptible to failure given the current financial status of the institution or overall morale of the staff. In this sense, ambulatory care requires a healthy financial system that acts as an incentive for those involved rather than a disincentive, as is the case when hospital income is based on inpatient numbers.

A modern approach to ascertain whether a patient should have surgery in the ambulatory setting is to ask, "Is there any reason why this patient should stay overnight?" In doing so, criteria can be formulated that address key variables in ambulatory care such as safety, quality, and economy. Again, questions should be asked about the potential worst-case scenario and issues of perceived quality; namely, "Is the patient best served in the hospital or at home with a responsible chaperone?" An important part of this thinking is to realize that complications may arise both with an inpatient and ambulatory plan for the patient. The key question will be if the ambulatory setting increases the risk of an unfavorable outcome per se, and whether the cost–benefit of choosing an inpatient status is reasonable.

Safety in ambulatory care

Prior to scheduling an ambulatory surgical procedure, a thorough preoperative evaluation of the patient is necessary to determine if they are an appropriate candidate for ambulatory surgery. The following contraindications may warrant postponement of surgery or inpatient surgical intervention: anticipation of significant blood loss or postoperative complication, concurrent unstable or serious illness, poorly compensated systemic disease, need for invasive monitoring, and inability or unwillingness to understand perioperative instructions.\textsuperscript{11} When appropriate preoperative evaluation and patient selection occurs, ambulatory surgery has shown to be safe with low associated morbidity. Studies show that unanticipated admission to the hospital and return visits occur in less than 3% of ambulatory surgical procedures.\textsuperscript{12} In a study of more than 45,000 patients for 30 days after an ambulatory surgical procedure, Warner et al. concluded that the major morbidity (i.e., respiratory, circulatory, cardiac) was similar to that in the general population not having surgery.\textsuperscript{13} In a more recent study of 18,500 Danish ambulatory surgical patients, there were no cases of death or permanent disability that could be ascribed to the procedure during a 90-day follow-up.\textsuperscript{14} However, such safety data are a result of qualified care with already high standards. In a study of ambulatory liposuction in Florida, Vila et al. found a 10-fold increase in mortality when these procedures were performed in physicians' offices with improper standards, compared with licensed ambulatory centers.\textsuperscript{15} This study, however, likely overestimated patient mortality rates.

Summary of key points regarding safety in ambulatory care:

(a) The safety is very close to 100% when proper ambulatory care is undertaken, thus emphasizing the need for zero tolerance for serious errors in patient handling.

(b) Ambulatory surgery is safe because of high standards of care. If the standards are suboptimal, ambulatory surgery (as well as inpatient surgery) may not be safe and acceptable.

(c) Some procedures and patients will continue to have higher risks of rare and/or serious complications that may not be completely avoidable by doing the procedure either in an inpatient or in an ambulatory setting. Thus, care for ambulatory patients should be carried out using the same standards and necessary resources as care rendered to inpatients.

Quality assurance

Quality assurance and improvement play a key role in maintaining the high standards of outpatient care that allow for ambulatory anesthesia to be both safe and effective. In the US, quality standards for ambulatory centers are enforced by The Joint Commission (TJC), which is the same organization that accredits inpatient facilities. Both the ASA and Accreditation Association for Ambulatory Health Care (AAAHC) and the American Association for the Accreditation
of Ambulatory Surgery Facilities (AAAASF) have established guidelines for ambulatory and office-based anesthesia as well.\(^{16}\)

There are a number of quality of care considerations favoring ambulatory care, which are listed below:

(a) The risk of having a hospital infection is reduced as the patients are subjected to less of the hospital environment, both in terms of exposure duration and also because ambulatory surgery centers are usually less contaminated by seriously ill inpatients. In a study done by Grogaard et al., the rate of infection after mixed ambulatory surgery during a 30-day observation period was 3.4%, being mostly benign, superficial wound infections.\(^{17}\) The infection rate in comparable inpatients was in the range of 5–15%. Also in a study by Holtz and Wenzel the infection rate was about 3 times higher in inpatients when compared with ambulatory surgery.\(^{18}\)

(b) Reversible cognitive dysfunction for some weeks or even months after surgery may be seen in up to 20–40% of the patients, more frequently with older age and extensive surgery.\(^{19}\) The risk of cognitive dysfunction 1 week after hernia repair in elderly patients was significantly reduced from 9.8% with inpatient care to 3.8% (similar to nonoperated) after ambulatory care.\(^{20}\) This seems logical: elderly patients especially, as well as psychiatric patients, patients with cerebral dysfunction, and children, may all be stressed and confused by being subjected to an unfamiliar environment and unfamiliar people, and the longer the exposure and more strangers involved the worse the effect. Thus, it is beneficial for these types of patients to be discharged back to their familiar environment as soon as possible.\(^{21}\)

(c) Less internal transport and fewer caregivers allow for a shorter chain of treatment in ambulatory care, usually involving the same caregivers throughout the duration of recovery. This increases continuity in terms of information provided and results in fewer miscommunications.

(d) Less bed rest and immobility allow for less postoperative morbidity. This contrasts with the inpatient setting, where being immobilized for extended periods of time may cause complications with gut function, lung function, deep vein thrombosis, and overall feelings of wellness.

(e) Fewer delays and cancellations occur in the ambulatory setting. The ambulatory surgical path is usually organized with its own nursing staff and dedicated facilities. The risk of a case being postponed because of an incidental burden from emergency care surgery or because there is no space in the post-anesthesia care unit (PACU) is decreased when compared to the mix of facilities with major inpatient surgeries.

(f) “Home is best.” If you ask patients where they want to be after surgery, provided that they feel safe, have no nausea and have well-managed pain, they usually prefer to be in the comfort of their own home.

Economic considerations

It is beyond the scope of this book to discuss the economics of the ambulatory healthcare system in detail. In brief, however, it can help decrease expenses associated with nursing care and patient accommodation, especially in the late evening and overnight. The costs of doing the procedure, including all costs related to surgery and anesthesia, are basically the same as if the patient were an inpatient.

Still, the situation may not be so simple. For a single hospital or unit to achieve such savings, the ambulatory program needs to be large enough to produce reduced staffing levels. Alternatively, the program needs to be predictable enough to release beds to other patients, thus increasing hospital production rather than saving money. In order for patients to have a rapid and uneventful recovery, more expensive anesthetic drugs may have to be used, but this expenditure may be recouped in reduced length of time in the operating room and reduced stay and need for nursing care in the PACU. Furthermore, perioperative ambulatory stays usually tend to avoid the dogmatic use of routine laboratory testing that may be present in the inpatient setting, thus further reducing costs and resource expenditure. The involvement of fewer caregivers reduces the need for patient handover and reduces the extent of double documentation, which is often seen when many people are involved with one patient. Establishment of an ambulatory service may by itself improve the efficiency of the hospital, as a large amount of work occurs in a predictable manner with few cancellations and no interruptions or disputes over emergent cases.

A potential cost problem with ambulatory care occurs when very expensive equipment (e.g., laparoscopy racks, robots, etc.) is used only during the daytime. However, this may be solved by having dedicated afternoon surgical cases or by using the equipment in other places in the hospital when the ambulatory operating room is down. Ambulatory
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Education and staff satisfaction

Healthcare staff, as most other people, are usually less inclined to work during evenings, nights, and weekends. Thus, staff recruitment and retention in ambulatory care units is usually very good. However, there is some concern that ambulatory surgery care units are too predictable and rarely present with emergencies and difficult situations, thus providing a less enriching and stimulating environment from an academic standpoint. This may be overcome by having personnel rotate in and out of the unit for those that are interested, and by having regular training in simulated emergency scenarios, such as advanced cardiopulmonary resuscitation. For the anesthesiologist, it may be useful to undergo these emergency-type simulations or to attend training sessions encompassing basic troubleshooting when managing patients with difficult airway, anaphylaxis, and invasive procedures.

As ambulatory surgery becomes more extensive, it is necessary to make the ambulatory unit an area of education and training for medical students, residents, surgeons, anesthesiologists, and nurses. This may be accomplished by requiring dedicated resources, such as instructors and time allotted for perioperative teaching. This can be accomplished without significantly delaying case performance, turnover times, or quality of care. [22]

References


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Chapter 2

Organization of ambulatory surgery and anesthesia
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A. Physical organization

Ambulatory surgery centers (ASCs) are modern healthcare facilities focused on providing same-day surgical care, including diagnostic and preventive procedures. As there is a steadily increasing demand for ambulatory surgical procedures, there are different levels of organizing ambulatory surgery facilities; from a single ambulatory case performed between scheduled inpatient procedures in an inpatient organization, to hospital outpatient departments (HOPDs), to centers dedicated completely to ambulatory surgical care, Ambulatory Surgery Center (ASC), as well as Office-Based Surgery (OBS) centers.[1] There are as many ASCs as there are hospitals in the United States. The first ASCs were established in the early 1970s. ASCs numbered 1000 in 1988. In 2013, there were over 5000.

ASCs have transformed the outpatient experience for millions of people, providing them with a more convenient alternative to hospital-based procedures. The growth in ASCs parallels a historic shift away from hospital inpatient surgeries. Many factors have contributed to this growth in ASCs, including changes in population demographics, new surgical and diagnostic techniques, changes in population health guidelines for disease screening, shorter-acting anesthetic agents, consumer and physician preferences, and payer incentives and reimbursement decisions to pay for care in the most cost-effective settings. ASCs offer alternative sites for surgical care including diagnostic and preventive procedures that do not require an overnight stay.[2]

The single ambulatory patient integrated in an inpatient organization

In this instance, the patients are integrated within an inpatient organization. It is planned in advance that they are to be discharged home after surgery. This model may be the only option in hospitals where mainly inpatient care is provided, or in very small hospitals. This may also be the model used when trying to expand ambulatory care services to new patient categories, using it as a pilot project for expanding ambulatory care. If the patient’s perioperative course is uneventful and the patient fulfills discharge criteria, the patient is sent home. If, however, care aspects such as analgesia, safety or anti-emesis are not met, the patient may be required to stay overnight. When it becomes evident that most of the patients in this new category actually go home, a new ambulatory patient treatment chain has been smoothly and effectively established.

The ambulatory program as part of an inpatient organization

When the ambulatory program is part of an inpatient organization, ambulatory care can be planned for the entire perioperative course. Preoperative instruction, intraoperative care such as choice of premedication, anesthetic, anti-emetic drugs, and minimizing opioids, as well as using cardiovascular, hormonal, and fluid therapies that focus on achieving an uneventful and fast recovery, can be tailored for an ambulatory patient. There should be an area as well as personnel dedicated fully to ambulatory care, with a phase 2 recovery room and a discharge area. The integration with inpatients usually occurs in the preoperative room and operating room which is part of the inpatient hospital facility. The hospital may attain better cost-efficiency through the fuller utilization of operating rooms and specialized equipment. These facilities can offer patients shorter...
waiting times. The downside is in coordinating those parts of the treatment pathways that are shared with inpatients. This includes having personnel who may not be wholly dedicated to providing ambulatory care.

The ambulatory unit integrated into an inpatient hospital

The ambulatory unit may be part of the hospital, but is run totally separate from the inpatient program. This occurs when there are enough ambulatory patients to run an ambulatory unit; however, major facilities are provided by the inpatient hospital. The unit runs five full days a week, with the hospital employing a dedicated ambulatory staff for all preoperative and postoperative care, and providing the patients with the comfort of not being exposed to the full hospital setting. Usually, this is a unit with a reception area, a preoperative holding area and a recovery area, and a discharge area. The integration with inpatients usually occurs in the operating rooms which is part of the inpatient hospital facility.

The benefit of this organization is that it enables the hospital to take full advantage of employing a dedicated ambulatory staff for all preoperative and postoperative care. The hospital may attain better cost-efficiency through the shared use of expensive operating rooms and specialized equipment for an increased total number of hours per week than can be achieved with two fully separate locations. The downside remains the demanding logistics implicit in coordinating those parts of the treatment pathways that are shared with inpatients. Problems may arise through having personnel who are not dedicated to ambulatory care and the potential for cancellation or delays of the ambulatory patient should the inpatient organization become overloaded with emergency cases.

The free-standing ambulatory unit

The free-standing ambulatory unit has all the benefits of being a separate unit in terms of personnel, routines, productivity, and economy. Having a fully separate unit makes it easier for cost-efficiency measures and to have separate budgets and accounting. It is also easier to promote team-building and to allow everyone in the treatment chain to reap the benefits of working together efficiently to get the cases done without delay, so as to avoid having to remain after hours. Short turnaround times and specialized focus by nurses and other support staff increase the efficiency. These offer the patients shorter waiting times, more convenient locations, ease in scheduling surgeries, lower co-payments and overall higher patient satisfaction with their experience. Physicians may have better control over staffing decisions and the ability to better manage their work environment. A larger ambulatory unit may also have its own ancillary services such as radiology, cardiology, and laboratories. Although the ambulatory unit may screen the patients for appropriateness for day surgery procedures, there will always be the need for the patient with a rare or serious complication to be admitted to an inpatient hospital, and this should be included in the planning. There may be a need to establish connections with a neighboring inpatient hospital should such a need arise.

The free-standing ambulatory unit inside the inpatient hospital

The ambulatory program has its own premises and dedicated perioperative staff, with the exception of maybe the anesthesiologists and the surgeons who are often employed by the mother hospital. The positive aspect of this model is that the hospital is readily available to provide backup for any extra testing, unplanned transition to inpatient care, for any prolonged recovery and unexpected emergencies. The doctors also have some flexibility in managing their time across hospital tasks and ambulatory care. The negative aspects are that an ambulatory case may have to wait for a doctor who is not dedicated to the ambulatory program.

The free-standing ambulatory unit as a satellite of the inpatient hospital

In this model, the ambulatory unit is physically separate from the rest of the hospital, either at the end of a long corridor, or in a separate building some distance away, but still close enough for access to expertise or unplanned admissions. Being geographically distant protects the ambulatory personnel from being moved to provide inpatient care if the main hospital is experiencing staff shortages or other problems. The downside of being at a distance is the more demanding logistics for patient transportation when extra tests or evaluations are needed, or in cases of emergencies or unplanned admissions.
What is the optimal size of a unit?

Unit size is usually defined as the number of operating rooms and surgical teams working simultaneously within it. Two major aspects are important in this context: the bigger the unit’s size, the greater the flexibility in the use of personnel and equipment, and the bigger unit’s size requires more managerial work to organize, coordinate, and plan for maximum benefit. Bigger units may be better able to handle staff absences, unpredictable length of cases, and other unforeseen circumstances.

Having only one operating room may work well and efficiently if the turnover time between patients is not too great, and there are enough instruments so that delays are avoided while equipment is being sterilized. With two operating rooms, two teams may work in parallel or, if the cases are short, one surgeon may utilize both rooms to optimize time. In systems with nurse anesthetists, one anesthesiologist may supervise up to four operating rooms.[3]

Free-standing office-based practice

These units almost always concentrate on a narrow selection of procedures, for instance solely dental surgery, ear, nose and throat (ENT), plastic surgery, gastrointestinal endoscopies, and so on. Most of these will also place restraints on patient selection so as to avoid serious complications and problems. These units can be very efficient, having very stable teams as they are focused on one type of patient and surgery. However, they can be lulled into a false sense of security as a consequence of infrequent exposure to problems, and not have adequate safety measures, fully qualified staffing, and all the requirements for the safe running of the center. Should a rare and occasional serious complication occur, the whole clinic may be under threat and investigated to see whether formal safety aspects and backup routines were adequate.

There is a growing trend for surgeries to be done in a doctor’s office.[4] This offers the convenience of having the procedure in what may be perceived as a more comfortable setting and with a quick return home. However, the procedure should be of a duration and degree of complexity such that the patient will recover and be discharged from the facility within a reasonably short period of time.

Surgical complexity in the office-based practice may range from Level 1 surgery, such as the excision of moles, warts, and cysts that require minimal preoperative sedation, to Level 3 surgery which includes procedures that would require general anesthesia or major conduction blocks. Healthcare practitioners themselves establish written policies regarding the specific surgical procedures that may be performed in their office. Procedures that involve significant blood loss, or major body cavities such as intra-abdominal or intra-thoracic, are not appropriate for the office setting.

Patient selection should be appropriate for the office setting. Although the lack of precise definitions for each ASA physical status can result in inconsistent ratings between practitioners, the ASA physical status of the patient should be considered, as it is the single most important predictor of morbidity and mortality for general surgery. Each office should establish guidelines that delineate criteria for patient selection for the office procedure, and should consider the patient’s medical status and comorbidities, the degree of stability of the medical conditions, the psychological state of the patient as well as the support system in place for accompanying the patient from the office and caring for the patient postoperatively.

The anesthesiologist providing care in the office setting should follow the standards and guidelines adopted by the American Society of Anesthesiologists in order to ensure the same measures of safety to all patients regardless of the venue of their surgery. The same anesthesia techniques used in hospitals and ASCs are used in office-based surgery centers. Problems for such units are ensuring that they fulfill all the requirements for patient safety.

Non-operating room anesthetizing locations

In the United States, the ASA Standards Guidelines and Policies should be adhered to in all non-operating room settings, except where they are not applicable to the individual patient or care setting. The European Society of Anaesthesiologists (ESA) as well as the World Federation of Societies of Anaesthesiologists (WFSA) have similar standards for patient care. Prior to administering any anesthetic, the anesthesiologist should consider the capabilities, limitations, and accessibility of the oxygen sources, and adequate and reliable sources of suction. There should be adequate monitoring equipment to allow adherence to the ASA “Standards for Basic Anesthetic Monitoring” and
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sufficient electrical outlets to satisfy anesthesia machine and monitoring equipment requirements. Appropriate post-anesthesia care should be provided, and there should be adequate staff to provide support for the anesthesiologist. An emergency cart with a defibrillator should be available, as well as emergency drugs and other equipment adequate to provide immediate cardiopulmonary resuscitation if necessary.

B. What is needed to run an ambulatory anesthesia practice?

For further reference it may be recommended to check the rules of accreditation for your unit in your institution or state. The ASA has published practice guidelines for ambulatory settings that address all aspects of patient care and facility administration.\[5\]

Equipment

Basic monitoring equipment should be available in all facilities: noninvasive blood pressure monitoring, electrocardiography, pulse oximetry, capnography for all intubations and all types of anesthetics, suction, gas monitoring of oxygen and all inhalational gases and patient temperature monitoring.\[5\] Scavenger systems should be present for all inhalational anesthetics. Alarms to alert to problems of gas delivery and low oxygen content in the ventilation gas should be available. In units carrying out more extensive surgery and for fragile patients, the ability to measure blood pressure invasively should be an option. Appropriate anesthesia apparatus and equipment should allow monitoring consistent with Society of Anesthesia standards, and all equipment should be maintained, tested, and inspected according to the manufacturer’s specifications, and documentation of regular preventive maintenance as recommended by the manufacturer should be followed.

Anesthesia professionals interact with many different types of monitors, machines, infusion pumps, and other equipment. Many of these devices have audible and/or visual alarms which are relied on to signal when set parameters and thresholds are violated, or when a potentially abnormal situation has occurred. Alarm systems must be such as to balance patient and provider safety risks against unintended consequences such as distraction, alarm fatigue, and intrusiveness. Alarm system settings in the equipment should be locally customized to reflect the patients and the practice, and should have an institutional process for changing any default alarm settings. Individual anesthesia professionals should not be able to change default alarm settings of any anesthesia equipment. Anesthesia professionals should adjust alarm settings as appropriate for a particular patient prior to starting an anesthetic. Clinicians should not indefinitely silence or disable alarms on any given device, unless it is necessary either because the device or module is not in use, or has malfunctioned, or the patient’s medical condition supports the AUDIO OFF or ALARM OFF modes.

Backup systems

Spare tanks of oxygen should always be ready for immediate use. In the case of emergencies, there must be fast access to a self-expanding ventilation bag with reservoir and extra oxygen supply, a defibrillator and emergency drugs, and intubation devices for difficult intubations: stylet, bougie, supraglottic airways, extra laryngoscopes, and fiber-optic or video laryngoscopic devices. Where neuraxial and regional blocks or extensive use of local anesthetics (e.g., lipo-suction) are being performed, there should be access to intravenous lipid emulsions for rescue in the event of local anesthetic-induced toxicity. Where inhalational anesthesia and/or succinylcholine are used, there should be medications, equipment, and written protocols to treat malignant hyperthermia (see chapter on Emergencies for details).

There should be backup electrical power sufficient to ensure patient safety in the event of an emergency and reliable means of two-way communication to request assistance. There should be written protocols for cardiopulmonary emergencies and other internal disasters such as a fire. All access to exit stairwells should be marked by illuminated signs that are on emergency power. The unit should have a written protocol in place for the safe and timely transfer of patients to a pre-specified alternate care facility when extended care or emergencies are needed in order to protect the health and well-being of the patient. For each location, all applicable building and safety codes and facility standards, where they exist, should be observed.\[6\]

Emergency procedures

Because disasters may occur, it is important that the ambulatory facility has written policies as to what should be done and who should do it. Disasters can
patients is necessary and by what route. The designee will also determine whether evacuation of coordinate information, and direct personnel. The manager or a designee to immediately assume responsibility for the implementation of the disaster plan to see that the police and fire departments are notified, coordinate information, and direct personnel. The designee will also determine whether evacuation of patients is necessary and by what route.

Security of medications
Safe storage and security of medications is a fundamental care process. A secure environment is needed for medication safety, including security of oral, sublingual, parenteral and inhaled drugs, and drugs used for elective and emergency patient care. Confirming that refrigerated items are stored under proper conditions is essential. Security of medications in the operating room suite is essential for patient safety. All schedule 3 and 4 medications must be kept in a locked, controlled area and only authorized persons should have access to controlled substances. A monitoring system for drug safety and security is an essential part of any ASC organization.

Education and training
Anesthesiology is the practice of medicine. Clinical privileges in anesthesiology are granted to physicians who are qualified by training to render patients insensible to pain and to minimize stress during surgical and certain medical procedures using general anesthesia, regional anesthesia, or monitored anesthesia care. In the United States, and in accordance with the ASA Guidelines, criteria to be considered for privileges in anesthesia include the following.

1. Graduation from a medical school accredited by the Liaison Committee on Medical Education (LCME), from an osteopathic medical school or program accredited by the American Osteopathic association (AOA), or from a foreign medical school that provides medical training acceptable to and verified by the Educational Commission on Foreign Medical Graduates (ECFMG).

2. Completion of an anesthesiology residency training program approved by the Accreditation Council for Graduate Medical Education (ACGME) or by the AOA.

3. Permanent certification by the American Board of Anesthesiology (ABA) or current recertification within the time interval required by the ABA.

4. Compliance with the ABA Maintenance of Certification in Anesthesiology program (MOCA).

5. Completion of Continuing Medical Education requirements (CME).

6. Compliance with relevant state or institutional requirements.

7. Demonstration of competence in Basic Life Support (BLS), Advanced Cardiac Life support (ACLS), and Pediatric Advanced Life Support (PALS) where applicable.

8. Current, active, unrestricted medical, or osteopathic license in a United States state, district, or territory of practice.

9. Current, unrestricted Drug Enforcement Administration (DEA) registration.

Subspecialty training is available for critical care medicine, pain medicine, pediatric anesthesiology, cardiothoracic anesthesiology, obstetric anesthesiology, and completion of the certification examination in perioperative trans-esophageal echocardiography.

Organizations may have a mixture of required and optional criteria and should determine which criteria to include and whether to include additional criteria based on the institution’s individual requirements and preferences. Some facilities may decide that certification by the Board of Anesthesia (American Board of Anesthesiology or in Europe, the European Board of Anaesthesiology) is a requirement, while others may deem board certification to be desirable but not essential. Some organizations may require subspecialty fellowship training for certain clinical privileges. Some organizations may wish to recognize residency training or certification awarded outside of the United States.

Staff
Professional staff should include physicians and other practitioners and nurses. They should hold a valid license or certificate and be qualified to perform their assigned duties. The anesthesiologist must be personally responsible to each patient for the provision of anesthetic care. The physician anesthesiologist is responsible for performing and verifying an appropriate pre-anesthetic evaluation of the patient, medical management of the anesthetic procedure and of the patient during surgery, post-anesthetic