

# Anaesthetic and management dilemmas in office-based surgery<sup>1</sup>

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Received 12 February 1998; received in revised form 18 March 1998; accepted 18 March 1998

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## Abstract

Given the changing patterns of healthcare delivery in the USA, it can be anticipated that office-based surgery and anaesthesia will continue to grow over the next few years. The development of newer surgical technologies and anaesthetics have facilitated the ability of the office to provide services that until recently were restricted to a hospital-based practice. Notwithstanding this shift of 'more intensive' surgical procedures to the 'less intensive' office environment, regulations need to be established to ensure patient safety. The anaesthesiologist must step forward as an advocate for patient safety and assume the leadership role in defining the practice environment, appropriate patient selection and types of anaesthetics for this site. Basic to the practice of office anaesthesia must be the tenet that the office be held to the same stringent standards that would apply in the traditional anaesthetizing locations. © 1998 Elsevier Science B.V. All rights reserved.

*Keywords:* Office-based anaesthesia; Office surgery; Patient and procedure selection; Patient safety

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## 1. Introduction

Given the changing patterns in healthcare delivery and the shifting of surgical procedures to less intensive settings, considerable growth is occurring in office-based surgery in the USA. As Fig. 1 illustrates, by the year 2001, approximately 14% of all surgeries will be performed in physicians' offices [1]. While the tradition of office-based surgery and office-based anaesthesia is well established, advances in surgical technology and the development of newer anaesthetics have contributed significantly to a continually expanding list of 'more intensive' procedures that are now performed in the office setting. Notwithstanding widespread support for the growth of this practice venue, there is growing concern regarding patient safety. The delivery of 'safe'

anaesthesia in the physicians' offices has been a major focus of concern. The anaesthesiologist, assuming the role of the perioperative medical specialist, must step forward and become the advocate for patient safety and welfare in this evolving practice environment.

Is office-based anaesthesia (OBA) different from ambulatory surgery? Office anaesthesia practice, in many ways, shares similar components with ambulatory surgery. Viewed as a natural extension of ambulatory surgery, many of the lessons learned by anaesthesiologists as ambulatory surgery practice grew, can now be confidently applied in the office setting. Nonetheless, there are some components of practice that are unique to the office. A guide to safe practice in this rapidly expanding venue must be the tenet that the same degree of vigilance used by anaesthesiologists over the last 15 years in selecting the appropriate patient and anaesthetics for ambulatory surgery, must now be applied to the office setting. The objective of this article is to discuss the dilemmas anaesthesiologists face in OBA regarding the practice environment, patient selection and types of anaesthesia appropriate for this setting.

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<sup>1</sup> This article is based upon a presentation given at the Postgraduate Assembly in New York City, December, 1997.

## 2. Procedures performed in the office setting

In 1996, an estimated 3.4 million procedures were performed in physicians' offices [2]. Plastic surgery (70%), dermatology, oral surgery, gynecology, podiatry and ophthalmology procedures accounted for the majority of surgeries performed in the office. ENT, dental (other than oral surgery) and arthroscopy procedures are also being performed in increasing numbers in this setting [3]. As the growth of office-based surgery continues, the procedures will expand beyond conventional self-pay cosmetic and dental procedures. One of the challenges faced by the office-based anaesthesiologist is the limited reimbursement policies. Appropriate reimbursement fees for office-based procedures is in a state of flux. While third-party payers have started to recognize the potential cost savings offered by the office, there is no consensus regarding reimbursement fees. Healthcare providers, having gained tremendous knowledge in economic and cost-effective outpatient care, can now offer this valuable experience to the office setting in negotiations with third-party payers for reimbursement fees for office surgery and office anaesthesia.

## 3. Providers of office-based anaesthesia

Who are the providers of office-based anaesthesia? Office-based anaesthesia care has been administered by many different providers with varying degrees of training and experience, including nurse anaesthetists, surgeons, dental anaesthesiologists and in growing numbers, physician anaesthesiologists. A survey of plastic surgeons revealed that 35% of surgeons administered intravenous sedation themselves; while neither a nurse anaesthetist nor an anaesthesiologist was present about 1/3 of the time. In addition, in monitoring of office patients receiving IV sedation by nonanaesthesiologists, 5% did not monitor blood pressure, 7% failed to use pulse oximetry and 11% had no EKG tracing [4].

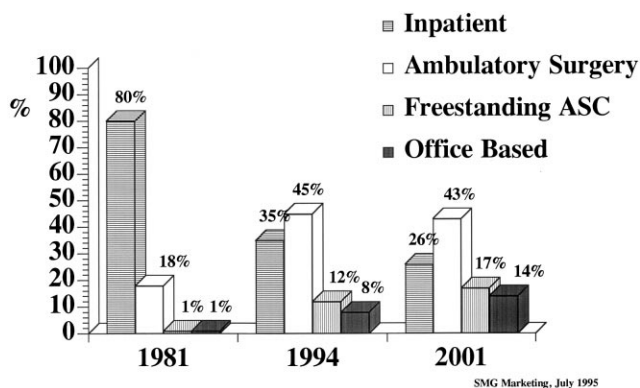


Fig. 1. Relocation in ambulatory surgery—past, present and future.

Table 1  
Office based anaesthesia and surgery

Check off list	
<input type="checkbox"/>	Facility design
<input type="checkbox"/>	Equipment and supplies
<input type="checkbox"/>	Patient flow
<input type="checkbox"/>	Hospital transfer agreement
<input type="checkbox"/>	Emergency set-up
<input type="checkbox"/>	Credentialed and licensed MDs
<input type="checkbox"/>	CQI and peer review

Does the spectrum of alternate providers of office anaesthesia care uniformly meet the same stringent standards of care as would be applied in the hospital or free-standing surgicenters? Based on these results, the answer must be a resounding 'no!' In response to reported mortalities and growing concerns about patient safety and quality of care in the office, regulatory agencies have begun to take active roles in efforts to establish guidelines and standards of care. To date, in the USA, three states (California, Florida and New Jersey), have approved legislation that regulate office surgery and anaesthesia [5–7]. It is anticipated that more states will assume an active role in introducing regulations to protect against the occurrence of unnecessary office related catastrophes. In addition, other regulatory bodies (e.g. New York State Commissioner of Health, The American Association for Accreditation of Ambulatory Surgical Facilities, Joint Commission for Accreditation of Healthcare Organizations), as well as professional societies (e.g. American Society of Anesthesiologists, Society for Ambulatory Anesthesia, American College of Surgeons), have also begun to examine the issue of safety standards and guidelines for office surgery practice.

## 4. Extended role of the anaesthesiologist

Beyond the responsibility to provide safe care, the office anaesthesiologist may be obligated to assume duties that would ordinarily be delegated to other personnel in the hospital or free-standing surgicenter: (1) ensuring accreditation of the facility as an anaesthetizing site; (2) ensuring appropriate credentials and hospital privileges of the surgeon; (3) ensuring a safely equipped office; development of emergency protocols; (4) appropriate patient screening/selection; (5) supervision of patient postoperative recovery; and (6) the development of quality improvement and peer review mechanisms [8] (Table 1).

The essentials of office anaesthesiology must apply the basic standards and monitoring for anaesthesia as established by the American Society of Anesthesiologists (ASA) (Table 2). The office anaesthesiologist must

Table 2

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· Make sure anaesthetizing location has:

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- Functioning resuscitation equipment and defibrillator
- Appropriate sized airways
- Laryngoscope blade, masks/LMAs
- Availability of dantrolene
- Tracheostomy kit
- Drugs
- Positive pressure capable of delivering oxygen
- Suction
- Back-up power

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ensure that the site is equipped to deliver positive pressure ventilation with self-inflating ambu-bag and that there is an identifiable source of oxygen. Suction may be delivered via a portable or installed system and all anaesthesia equipment should have a reliable back-up power source in the event of equipment failure. To handle any emergency following anaesthesia, functioning emergency airway equipment, drugs and a defibrillator is a must in the office. In locations where only local anaesthesia is administered, appropriate drugs, monitors and equipment for the treatment of untoward reaction should be available. While technicians and biomedical engineers are readily at hand in the hospital-based or ASCs to oversee equipment failure and up-keep, such is not the case in the office setting. Therefore, it is crucial that service checks and equipment maintenance be rigorous and strictly enforced. Furthermore, the anaesthesiologist must acquire familiarity with machine setup, as well as comfort of use. In off-site locations, the anaesthesiologist functions as both the pharmacy and pharmacist and must ensure that a full complement of medications is readily available, including those drugs necessary to resuscitate a patient in the event of cardiac or respiratory emergency (Table 3). Dantrolene must be readily available to treat malignant hyperthermia, if triggering anaesthetic agents are used [8].

Unlike the operating rooms (OR) located in hospitals or surgicentres, there is a significant variance in the set-up of off-site anaesthetizing locations. Therefore, it is important for office anaesthesia providers to check the particular site before the day of surgery to confirm

Table 3

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The anaesthesiologist assumes responsibilities:

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- Anaesthesia equipment
  - Monitors
  - Pharmaceuticals
  - Resuscitation equipment/drugs
  - Recovery phase
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Table 4

Postanaesthesia discharge scoring system (PADSS) and clinical discharge criteria used in office-based surgery setting [11]

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Postanaesthesia discharge scoring system (PADSS)

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1. Vital signs
  - 2 = within 20% of preoperative value
  - 1 = 20–40% of preoperative value
  - 0 = >40% preoperative value
2. Ambulation
  - 2 = Steady gait; no dizziness
  - 1 = Ambulate with dizziness
  - 0 = None/or ambulates and feels dizzy
3. Nausea and/or vomiting
  - 2 = Minimal
  - 1 = Moderate
  - 0 = Severe
4. Pain
  - 2 = None (pain score = 0)
  - 2 = Minimal (pain score = 1)
  - 1 = Moderate (pain score = 2)
  - 0 = Severe (pain score = 3)
5. Surgical bleeding
  - 2 = Minimal
  - 1 = Moderate
  - 0 = Severe

Clinical discharge criteria

1. Stable vital signs
  2. Patient is alert and oriented
  3. Patient is free of nausea and vomiting
  4. Steady gait
  5. Patient is not bleeding
- 

Total PADSS score is 10; score  $\geq 9$  considered fit for discharge.

that the environment is equipped with appropriate equipment, supplies and appropriately trained personnel with the capability to efficiently handle emergency situations. The office anaesthesiologist may also become involved with facility design at the inception of the office set-up. Once again, the experienced anaesthesiologist can apply valuable knowledge gained in the ambulatory setting to ensure that the components necessary for safe office practice are in place (e.g. ascertaining site compliance with applicable building codes, hiring of qualified personnel and that the requirements for acquiring accreditation are satisfied).

### 5. Patient selection

Patient selection for office-based surgery will continue to evolve along with anaesthesia and surgical advances. In a 1997 SAMBA survey, office-based practitioners reported one of the major problems encountered in the office setting to be inappropriate patient selection [3]. Although there is high patient preference for office procedures, not all patients are suited for office anaesthesia. ASA physical status remains a key

element in patient selection [9]. However, other elements are less clear. A review of closed-claims involving anaesthesia morbidity and mortality in dental offices revealed that major morbidity involved patients with pre-existing conditions such as morbid obesity, cardiac disease, epilepsy and COPD [10]. Limiting the scope of procedures and patient selection for office surgery and anaesthesia is appropriate at this time until more extensive outcome data become available and a standardized approach to outcomes measurement is recognized. Standards for office anaesthesia and surgery in New Jersey (USA), for example, allow ASA 3 patients to receive topical, local or minor peripheral blocks and conscious sedation only, in the office setting; but only after an appropriate medical evaluation is conducted. Only ASA 1 and 2 patients may receive general anaesthesia or major regional anaesthesia in office practice in New Jersey [7].

The anaesthesiologist, asserting his role as medical specialist, is best suited to evaluate the patient risk for office-based anaesthesia. A patient medical history may be obtained via a questionnaire or a preoperative telephone call. The advent of computer technology and the sharing of information systems among physicians' offices will prove valuable. The potential for patients to transmit a health questionnaire via the Internet to the office, is already being evaluated. Regardless of method, every patient should have some contact with the anaesthesia provider prior to the day of surgery. As reliance on the surgeon provider is more than would be encountered in the hospital setting, clear communication between surgeon and the anaesthesia provider is crucial to outline what constitutes risks for the patient. Further, when indicated, the patient should be referred to the primary care physician, not for anaesthesia clearance but only to optimize the patient before surgery.

Patient selection for office-based procedure should be the same as would be for ambulatory surgery. The inappropriate office patient include the unstable ASA 3 or 4 patients, brittle diabetic, substance/alcohol abuser, the poorly controlled diabetic, the patient with seizure disorder; the malignant hyperthermia-susceptible patient, the morbidly obese, as well as the patient with no responsible adult escort.

## 6. Patient recovery and discharge

As with patient selection, discharge criteria for the office setting should be no different than would be applied to the patient in the ASU setting: (1) a patient who is awake and oriented; (2) with stable vital signs; (3) minimal pain or bleeding; (4) minimal nausea/vomiting; (5) ambulatory without dizziness; and

(6) responsible person present for escort home (Table 4) [11]. The recovery of patients in this setting may be delegated to a qualified Post Anaesthesia Care Unit (PACU) nurse, although the anaesthesiologist is responsible for postoperative recovery and discharge.

A unique component of the office site is the absence of traditional gurneys. Patients must therefore transfer from the OR table to a chair or walk with assistance to the designated recovery area. Facilitated by the development of newer and shorter-acting anaesthetics, the office patients usually achieve sufficient anaesthesia recovery in the OR, so they can be transferred directly to 'Phase 2' recovery area and bypass the traditional 'Phase 1' recovery area. This 'fast-tracking' concept of patient recovery comes with the realization that time is not as crucial as is the requirement that recovery criteria are achieved. In the current environment of cost containment, the concept of 'fast-tracking' learned in the office setting can be brought back and applied in the hospital and ASCs.

## 7. Anaesthetic management

The goals of office-based anaesthesia are very similar to that for the hospital setting. The surgeon desires a quiet surgical field, almost immediate postoperative ambulation, no nausea or vomiting and rapid discharge home. The anaesthesiologist and the patient desire analgesia, amnesia for procedures, no nausea or vomiting, with feeling of well-being for rapid discharge home and high satisfaction.

Many of the anaesthetic techniques used in surgical centres and hospital facilities are suited to the office; however, there are some limitations. Intravenous sedation (propofol, barbiturates, midazolam, demerol) is the most often used anaesthetic technique in this setting. Generous use of local infiltration is strongly recommended to decrease postoperative pain; as is the use of ketorolac (Toradol®), and other non-steroidal antiinflammatory drugs to augment analgesia through the recovery period. If regional anaesthesia is administered, the site must have provisions in place in the event of toxicity or other sequelae from unanticipated anaesthesia mishaps. For general anaesthesia, some practitioners prefer to use total intravenous anaesthesia (TIVA), because of the lack of capacity to deliver inhalation agents or N<sub>2</sub>O and the need for adequate waste scavenging system.

While all types of anaesthesia techniques are potentially appropriate for the office setting, many practitioners prefer the technique of Monitored Anaesthesia Care (MAC). Unfortunately, as reported in ASA closed-claims study, the number of closed-claims involving MAC anaesthesia-related mishaps are increasing in numbers to rival that of general

anaesthesia-related (GA) cases [12]. The administration of MAC anaesthesia in the office does not confer immunity against mishaps. Regardless of the choice of office anaesthetic technique, practitioners must exercise caution and vigilance. If the anaesthesiologist decides to administer GA with inhalation agents in the office, an adequate and reliable system for scavenging the waste gases must be in place. In addition, office-based GA requires that the anaesthesia machine used be equivalent in function to that available in the traditional OR. To date, there has been limited choice of an available anaesthesia machine for the office practice that would provide the same degree of user comfort and options as those found in traditional anaesthetizing locations. However, at least one promising mobile, very compact machine with complete anaesthesia delivery capability intact, will soon be available on the market.

## 8. Summary

The anaesthesiologist faces many challenges in the office-setting. Most importantly, however, the anaesthesiologist must recognize that safe anaesthesia practice in the office requires appropriate patient selection, uniform adherence to standards, regardless of practice setting and the establishment of quality assurance and peer review mechanisms. The experienced gained in ambulatory surgery and office surgery can be equally shared and appropriately applied.

## Acknowledgements

The author acknowledges Barbara McEwan RN for her editorial assistance.

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