

ment under Ambulatory Surgery indications ; a sedated patient, in ambulatory OR under Anesthesiologist surveillance, represents the safest way to treat patients. SW has no report of complications when properly administered to, but many times aged or damaged people requires a deep transitory care to be able to receive this new technology.

To date, we work with 2 Orthopaedic Devices (Orthospec/Medispec) and one Dornier Compact Alpha; our experiences includes 750 treatments&observations done, following ISMST / ISF indications, in order to get a coherent experience.

It will be show actual indications, numbers and cases available, histological correlations and new trends in Orthopaedic Shockwaves solved with concourse of Ambulatory Surgery.

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#### PARALLEL SESSION 7

##### OFFICE-BASED SURGERY

*Chairmen: Roberts L, (Australia).  
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##### OFFICE BASED SURGERY - "DESIGN AND STANDARDS. ACCREDITATION GUIDELINES"

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Office based surgery in specifically designed and constructed facilities attached to medical practitioners' consulting rooms has not developed in Australia up to the present time, although there is potential for approximately 25% of all procedures, mostly minor operations/procedures, to be carried out in these facilities.

In 2001 the Australian Day Surgery Council prepared Guidelines for the Accreditation of Office Based Surgery Facilities. It is essential that high standards of quality and safety are provided and some of the most important recommendations in the Guidelines will be emphasised.

The design of these facilities should be simple with emphasis on safety, quality, function and cost efficiency. A model design based on an existing facility in Sydney will be presented followed by illustrations of its features.

The patient and financial advantages of office based surgery will be discussed with comparative cost data for ambulatory surgery centres and acute bed hospitals.

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##### OFFICE-BASED SURGERY: CHOICE OF PATIENTS, ANESTHESIA AND PROCEDURES

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##### SUGGESTED REFERENCE

American Society of Anesthesiologists' informational manual:

"Office-Based Anesthesia:

Considerations for Anesthesiologists in Setting Up and Maintaining a Safe Office Anesthesia Environment".

<http://www.ASAhq.org/publicationsAndServices/physician.htm#office>

I. Administration and Facility.

II. Clinical Care

##### SELECTED SECTIONS (EDITED)

###### Procedure Selection

Procedure selection defines the types of surgical procedures that can be performed under office-based anesthesia. A review of existing state regulations and professional recommendations reveals a wide variation as to how much the state or regulating body assumes the responsibility for defining the complexity of case that can be performed, and how much is left to the practitioner to define for him/herself. For example, the regulations governing office-based anesthesia in some states have defined the level of surgical complexity based on the extent to which sedation or anesthesia is required. This ranges from Level 1 surgery, such as excision of moles, warts and cysts requiring minimal preoperative tranquilization, to Level 3 surgery, which includes procedures that would reasonably require general anesthesia or major conduction anesthesia. In other states, health care practitioners themselves establish written policies governing the specific surgical procedures that may be performed in their office. Some procedures have specific physiologic needs that the anesthesiologist should be aware of. These

include, but are not limited to tumescent liposuction, hysteroscopy with glycine and oral reconstructive surgery.

Scheduling of procedures should take into account both the need to have patients recover adequately and the desire to avoid discharge delays. This may require that patients who undergo longer procedures or who need longer observation are scheduled early and shorter procedures to follow.

Notwithstanding these definitions of surgical complexity, the anesthesiologist should satisfy him/herself that the procedure to be undertaken is within the scope of practice of the health care practitioners and the capabilities of the facility. Procedures involving significant blood loss, major intra-abdominal, intrathoracic or intracranial cavities are not appropriate for the office setting. Furthermore, the procedure should be of a duration and degree of complexity that will permit the patient to recover and be discharged from the facility within a reasonably short period of time. The procedure to be performed should be agreed upon by the patient, anesthesiologist and surgeon before the procedure is undertaken and before sedative medication is administered to the patient.

**Preoperative Patient Selection**

Each office should establish guidelines that describe criteria for determining patient selection for office procedures. These guidelines will take into account:

1. Patient's medical status.
2. Degree of stability of that medical status.
3. Patient's psychological status.
4. Patient's support system at home (social evaluation).

The assessment of the medical condition of the patient is based on history, physical examination and such laboratory studies as determined by the surgeon, primary care physician, consultant and/or anesthesiologist. The history and physical examination should be performed by the surgeon or his/her designee. This history and physical should be both current (within 30 days or as defined by state regulation) and reassessed by the surgeon as unchanged on the day of the procedure. The choice of preprocedure laboratory tests, CXR and EKG should be guided by the patients underlying medical condition and the likelihood that the results will affect the anesthetic plan.

The following is a partial list of specific factors that should be taken into consideration when deciding whether anesthesia in the office setting is appropriate:

- a. Abnormalities of major organ systems, and stability and optimization of any medical illness.
- b. Difficult airway
- c. Previous adverse experience with anesthesia and surgery.
- d. Current medications and drug allergies.

- e. Time and nature of the last oral intake.
- f. History of alcohol or substance use or abuse.
- g. Presence of an adult who assumes responsibility specifically for caring for and accompanying the patient from the office.

**Intraoperative Care – Anesthesia Issues**

Anesthetic techniques used in the office setting range from local infiltration and sedation to general anesthesia. Sedation is recognized as a continuum from anxiolysis, moderate sedation/analgesia (conscious sedation), deep sedation/analgesia, to general anesthesia.

The depth of sedation/analgesia achieved varies from patient to patient in the amount of drug required and the rapidity of the induction. Major conduction anesthetics may result in cardiovascular collapse, respiratory insufficiency or a failed block requiring supplementation or general anesthesia. It is imperative for the office practitioner to be prepared with all needed equipment, drugs and skills for rescue and resuscitation, including oxygen, positive pressure ventilation, airway aids, resuscitation medications and continuous anticipation of potential untoward events. The most important clinical aspects of giving anesthesia remain the training, experience, continuing education and vigilance of the anesthesia personnel.



**SURGERY IN THE ASC OR OFFICE – IS THERE ANY DIFFERENCE?**

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During the 1980s, many surgical procedures previously performed in hospitals began to be performed in freestanding ambulatory surgery centers (ASCs). By the 1990s, more than 50 per-

cent of all surgeries were performed in the ambulatory setting. While many initially questioned whether these procedures could be safely done outside the hospital, the safety of surgeries performed in licensed ASCs is now accepted. Beginning in the 1990s there was another shift, with greater numbers of surgical procedures being performed in physician offices that had previously been performed in ambulatory surgery centers. While there is little data on the actual numbers of office surgeries, it has been estimated that up to 1.2 million procedures nationwide per year are currently being performed. Unlike ambulatory surgery centers, which are highly regulated by governmental agencies, the physician office is usually not.

State medical boards are slowly moving toward enhanced office-based surgery regulation. However to date, only ten states (Arizona, California, Connecticut, Florida, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, and Texas) have placed regulations on office-based procedures, and only a few states require any reporting of adverse events that occur in offices. In April 2001, the Federation of State Medical Boards formed a special committee on outpatient (office-based) surgery. The Federation House of Delegates adopted the committee recommendations as policy in April 2002. The 16-page model guidelines include recommendations on administration, personnel, patient evaluation, anesthesia, accident reporting, facilities accreditation and liposuction procedures.

The Florida Board of Medicine first instituted a standard of care for office-based procedures in 1994. Following a number of deaths in the subsequent five years, the Board sought to strengthen the standards. After almost two years of extensive debate, the Board issued a new standard of care for office surgery in March 2000. The new rules included requirements for limiting the types and length of procedures, accrediting the office facilities, credentialing the surgeons, determining the appropriate level of training for anesthesia personnel, and mandatory reporting of adverse incidents. Prior to this, there had been no central source of data regarding adverse incidents in physician offices in Florida.

We used this data to compare outcomes for patients undergoing surgery in Florida physician offices to ambulatory surgery centers.

All adverse incident reports to the Florida Board of Medicine for procedure dates March 2000 to April 2001 were reviewed. The numbers of office procedures performed during four consecutive months of this period were also obtained from the Board of Medicine and used to estimate the number of procedures performed during the study period. Ambulatory surgery death summaries, adverse incident data and volumes of procedures for the year 2000 were procured from the Florida Agency for Health Care Administration (AHCA).

Adverse incident reports were reviewed by

multiple parties, and only reports that involved an office surgical procedure and resulted in injury or death were included in the outcomes calculation. Ninety-three of the 182 reports met these criteria. Independent extraction of reports by multiple reviewers was performed.

Adverse incidents occurred at a rate of 66 and 5.3 per 100,000 procedures in offices and ambulatory surgery centers, respectively. The death rate per 100,000 procedures performed was 9.2 in offices and 0.78 in ambulatory surgery centers. The relative risks for injuries and deaths for office procedures vs. ambulatory surgery centers were 12.4 (95% CI 9.5 to 16.2) and 11.8 (95% CI 5.8 to 24.1) respectively.

A statistical analysis of the impact of requirements for surgeon credentialing, office accreditation, and the presence of an anesthesiologist could not be determined because of insufficient data on the patients who did not suffer adverse incidents. Information from the incident reports for the patients who died in offices did indicate good compliance with requirements for surgeon board certification and hospital privileges. Unfortunately, the accreditation requirement was poorly met, with less than half of the offices in compliance. This finding is identical to that contained in a recent report by Coldiron, who only looked at 19 months of Florida data. An anesthesiologist was present in only 15 percent of the cases resulting in death; however, Florida only recently enforced the rule requiring the presence of an anesthesiologist for level III anesthetics, and it is not clear if the circumstances warranted this level of anesthesia for the procedures performed. However, anesthesiologists are present in nearly all ambulatory surgery centers, and were present in the Hoefflin report of no office deaths in 23,000 procedures. This suggests their presence may be a factor in more favorable outcomes.

In this review of surgical procedures performed in offices and ambulatory surgery centers in Florida over the past two years, there was an approximately ten fold increased risk of adverse incidents and death in the office setting.

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**OFFICE BASED TOTAL INTRAVENOUS ANAESTHESIA (TIVA)**

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The office based setting is characterized by a high turn-over of patients, elective patients with stable general health, and surgery of minor and intermediate invasiveness. Often the anaesthesiologist have to work in an environment not specially designed for anaesthesia, that is no built-in pipelines for oxygen, nitrous oxide or scavenging and un-spacious facilities; both for anaesthetic and post-anaesthetic care. Whereas there is a high focus on cost-efficiency and rapid, uneventful recovery; the demand for maximum safety is still mandatory, as no mishaps are tolerated in this setting.

Total intravenous anaesthesia (TIVA) is to pro-

vide analgesia, sleep, depression of autonomic reflexes and, if needed, muscle relaxation with only intravenous drugs. There is an increased interest in TIVA in the office based setting for several reasons:

- New intravenous drugs have come to marked with a rapid onset and shortlasting effect, even after prolonged use; allowing for more precise control of anaesthetic effect.

- Knowledge on pharmacokinetics and pharmacodynamics have increased, providing basis for rational choice of drugs and, especially, how to dose and combine in an optimal way.

- Infusion pumps and computerized delivery systems have improved, making use of intravenous drugs more simple and safe.

- There is an increased focus on the environmental effects of waste inhalational agents, both locally in the OR and in the global perspective.

- Increased focus on versatile and cost-effective anaesthetic service, e.g. to minimize the investments in anaesthetic machines, gas delivery systems and scavenger equipment, such as with the use of TIVA.

There are also some well known benefits of intravenous anaesthetics compared with inhalational agents:

- The drugs are more specific. Most inhalational agents are good hypnotics and weak analgesics, which means that the hypnotic component will be overdosed when appropriate analgesia and reflex control are secured with only an inhalational agent. The intravenous agents, on the other hand, allow for specific, tailored "component" therapy; using one specific drug for sleep and another one for analgesia.

- TIVA with propofol as hypnotic agent is generally associated with less post-operative nausea and vomiting, less shivering and a more pleasant emergence than inhalational agents.

However; there are also potential negative aspects of intravenous anaesthesia which should be considered when employed:

- Intravenous drugs do in general result in slightly slower immediate awakening when compared to modern inhalational agents: sevoflurane, and particularly desflurane and also nitrous oxide.

- Inhalational drugs, in general, provide better preserved spontaneous ventilation than intravenous techniques.

- Inhalational drugs are easier to monitor, because end-tidal measurements provide an on-line, continuous guide to drug levels in serum.

Thus, if nitrous oxide is available, many anaesthesiologists will prefer to use it as a supplement to TIVA because reduction in dose of iv drugs is possible. Further, nitrous oxide has a very rapid on-off effect and absence of respiratory depression.

Apart for EMLA cream for smooth iv line insertion in kids, sedative premedication is rarely indicated in the office based setting. However, preo-

perative use of paracetamol and NSAID or coxib may be very useful for pain prophylaxis.

### **PRACTICAL USE OF PROPOFOL FOR TIVA**

For hypnotic iv infusion, propofol is the dominating drug in use presently, and focus will be on this drug in this presentation. TIVA for surgery almost always employ a mixture of an analgesic drug with propofol; the dosing levels of the two components may vary due to the choice of opioid and the type as well as length of surgery. With the very shortacting opioid remifentanil, the dose of propofol should be in the lower range and remifentanil somewhat more generously given; whereas with alfentanil, sufentanil and especially fentanyl the propofol dose should be higher and the dose of opioid minimized. One way of reducing the opioid need is to provide some baseline analgesia with local anaesthetics, paracetamol, NSAIDs, coxibs and/or corticosteroids before start of surgery. For very short procedures (e.g. less than 20 min) alfentanil may be used as the only opioid, starting with 0.5-1.5 mg (adults) and supplying additional 0.5 mg as needed, alternatively as an infusion of 0.5-1.5 microg/kg/min. For best control and most rapid emergence, remifentanil is a very forgiving drug; due to ultra-fast elimination. Appropriate dosing levels will be 0.05-0.1 microg/kg/min for sedation and spontaneous respiration; 0.1-0.3 microg/kg/min for minor surgery and 0.2-0.5 microg/kg/min for more extensive surgery. For intubation without curare, a bolus dose of 1 microg/kg may be given or an infusion of 1 microg/kg/min may be given for 2-3 minutes, concomitantly with start of propofol infusion. For better control of propofol dose, the BIS (Bispectral index) may be useful. With this device one may pick out those patients who need less than standard doses of propofol and reduce the dose accordingly, resulting in lower drug costs and faster awakening.

The use of neuromuscular blockers will not be substantially different with TIVA compared with inhalational techniques, except for a somewhat larger dose of neuromuscular blocking agent will be needed for maintenance when no potent inhalational agent is used.

### **TARGET CONTROL SYSTEMS**

With propofol, usually a level of 2.5-3.5 microg/ml is appropriate together with opioids for surgical anaesthesia. The higher level should be used when curare is given concomitantly. If nitrous oxide is supplied, the TCI level could be reduced down to 1.5-2.5 microg/ml. However, starting an anaesthetic with this level may result in a very slow induction, thus an overshoot is usually required initially: TCI of 4-5 microg/ml (the lower value in elderly patients or patients with strong premedicant effect) until the patient is asleep and then down to maintenance level. Alternatively an

effect site TCI system may be used in order to have more rapid induction and adjustments of ongoing anaesthetic level. For remifentanil TCI a level of 2.5-7.5 ng/ml (corresponding roughly to 0.1-0.3  $\mu$ g/kg/min stable infusion) will usually be appropriate.

### **CONCLUSION**

An appropriate mixture of propofol with an opioid total intravenous anaesthesia will be my favourite for office based anaesthesia. It is important to focus on the appropriate timing and dosing of drugs in order to minimize time for emergence. Further, focus on anti-emesis and non-opioid post-operative analgesia is very important in this setting.

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### **PARALLEL SESSION 8**

#### **THE PATIENT AS A CENTRAL FOCUS OF IMPROVEMENT**

*Chairmen: Lemos P, (Portugal).  
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#### **AMBULATORY SURGICAL PATIENT SELECTION – EVIDENCE BASED REVIEW**

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### **PURPOSE**

To identify and characterize the evidence supporting decision made in the care of patients with selected medical conditions undergoing ambulatory anesthesia and surgery. Conditions highlighted in this review include: the elderly, heart transplantation, hyper-reactive airways disease; coronary artery disease; and obstructive sleep apnea, diabetes mellitus; morbid obesity; the premature infant; the child with an upper respiratory infection; malignant hyperthermia; and monoamine oxidase inhibitors.<sup>1,2</sup> This talk will focus on sleep apnea, elderly and morbid obesity.

### **SOURCE**

A series of case scenarios and questions was developed to highlight management issues for selected high risk patients. Structured search of MEDLINE (1966-2003) was performed using key-