Office-Based Anesthesia: NUTS AND BOLTS
A Joint Meeting Presented by the ASDA and SAMBA

September 13, 2014 | Gaylord Opryland Resort & Convention Center | Nashville, TN

Jointly sponsored by American Society of Anesthesiologists
PROGRAM INFORMATION

Target Audience
This meeting is designed for anesthesiologists and anesthesia providers and practitioners who specialize in ambulatory or office-based anesthesia.

About This Meeting
Topics for this meeting were selected by a joint committee on office-based anestheisa by the Society for Ambulatory Anesthesia and the American Society of Dentist Anesthesiologists, as well as by board members, reviews of published literature with the highest impact on the specialty, and by soliciting suggestions from members of SAMBA and ASDA who are active in the clinical practice of ambulatory anesthesia.

The purpose of this meeting is to educate and share information that will enable office-based practitioners to provide the highest level of ambulatory anesthesia services and improve patient outcomes.

ACCME Accreditation and Designation Statements
This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of the American Society of Anesthesiologists and the Society for Ambulatory Anesthesia. The American Society of Anesthesiologists is accredited by the ACCME to provide continuing medical education for physicians. The American Society of Anesthesiologists designates this live activity for a maximum of 6.75 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Disclosure Policy
The American Society of Anesthesiologists and the Society for Ambulatory Anesthesia adhere to ACCME’s Essential Areas, Standards, and Policies regarding industry support of continuing medical education. Disclosure of the planning committee and faculty’s commercial relationships will be made known at the activity. Speakers are required to openly disclose limitations of data and/or any discussion of any off-label, experimental, or investigational uses of drugs or devices in their presentations.

The American Society of Dentist Anesthesiologists is an ADA CERP provider of continuing education, and adheres to all ADA CERP standards and guidelines.

Disclaimer
The information provided at this activity is for continuing medical education purposes only and is not meant to substitute for the independent medical judgment of a physician relative to diagnostic and treatment options of a specific patient’s medical condition.

Statement of Need
The Office-Based Anesthesia Conference provides a forum devoted exclusively to office-based anesthesia at which leaders in the field present clinical updates as well as resources for practice management.

OBJECTIVES
- Identify how to prepare for the unique anesthesia requirements that come with extremes of age in an office-based practice
- List the factors which determine fiscal viability of an office-based anesthesia practice
- Describe key elements relating to surgical procedures that determine suitability for office-based practices
- Review current regulatory trends changes affecting office-based anesthesia

Resolutions of Conflicts of Interests
In accordance with the ACCME Standards for Commercial Support of CME, ASA and SAMBA will implement mechanisms, prior to the planning and implementation of CME activity, to identify and resolve conflicts of interest for all individuals in a position to control content of this CME activity.

In accordance with the ADA CERP Standards for Commercial Support, ASDA will ensure resolution of any potential conflicts of interest.

Special Needs
SAMBA and ASDA fully comply with the legal requirements of the Americans with Disabilities Act and the rules and regulations thereof. If any attendee in this educational activity is in need of accommodations, please contact SAMBA at 312-321-6872.
## FACULTY AND PROGRAM SCHEDULE

### Program Chairs and Faculty

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| Indiana University | 9:05 a.m. – 9:40 a.m. **Extremes of Age in the Office: How Young and How Old?**  
Thomas Wherry, M.D. |
| Arnaldo Valedon, M.D. | 9:40 a.m. – 10:15 a.m. **Inhalational Anesthesia in the Office: Best or Last Choice?**  
Steve Ganzberg, D.D.S. |
| Chief Ambulatory Division and Managing Partner, First Colonies Anesthesia Associates | 10:15 a.m. – 10:30 a.m. **Break** |
| Reisterstown, MD | 10:30 a.m. – 11:05 a.m. **OBA Literature Review**  
Richard Urman, M.D. |
| Richard Urman, M.D. | 11:05 a.m. – 11:40 a.m. **Drug Shortages: How Is It Affecting the Office-Based Practitioner?**  
Zakaria Messieha, D.D.S. |
| Assistant Professor of Anesthesia, Brigham and Women’s Hospital | 11:40 a.m. – 12:15 p.m. **Patient and Procedure Selection in the Office**  
Steve Smith, M.D. |
| Boston, MA | 12:15 p.m. – 1:30 p.m. **Lunch** |
| Zakaria Messieha, D.D.S. | 1:30 p.m. – 2:05 p.m. **Patient and Procedure Selection in the Office**  
Steve Smith, M.D. |
| ASDA Board Director, University of Illinois | 2:05 p.m. – 2:40 p.m. **OBA Billing and Collections**  
Chandra Stephenson, CPC |
| Chicago, IL | 2:40 p.m. – 3:15 p.m. **Designing and Sustaining an OBA Practice**  
Steve Smith, M.D. |
| Theodore Passineau, JD | 3:15 p.m. – 3:30 p.m. **Break** |
| Senior Clinical Risk Management Consultant | 3:30 p.m. – 4:05 p.m. **Legal Pitfalls of OBA Practice**  
Wendy Longmire, J.D. |
| Medical Protective | 4:05 p.m. – 4:50 p.m. **Problem-Based Learning Discussions (PBLD’s)** |
| Fred Shapiro, D.O. | 4:50 p.m. – 5:00 p.m. **Closing Remarks** |
| Chair, ASA Committee on Patient Safety and Education | |
| Assistant Professor of Anesthesia, Harvard Medical School | |
| Department of Anesthesiology, Critical Care and Pain Medicine | |
| Beth Israel Deaconess Medical Center | |
| Boston, MA | |
| Stephen Smith, M.D. | |
| Premier Dental Anesthesiology | |
| Ballwin, MO | |
| Thomas M. Wherry, M.D. | |
| Surgical Center of Maryland | |
| Silver Spring, MD | |
| Chandra Stephenson, CPC | |
| Steven Ganzberg, D.M.D, M.S. | |
| ASDA Past President, UCLA | |
| Los Angeles, CA | |
| Zakaria Messieha, D.D.S. | |
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- **Ambulatory Anesthesia for Patient with Confirmed History of MH and Allergy to Soy and Egg Phospholipids**
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- **Extremes of Age — Issues in Office-Based Setting**
  Thomas Wherry, MD

- **Hypotension While on Phentermine**
  Arnaldo Valedon, MD

**Note Pages**
The Extremes

The very young.....
& the very old.....
Presenting for office-based surgery

Thomas M. Wherry, MD
Physician Leadership Board, Surgical Care Affiliates, Inc.
Member, First Colonies Anesthesia Associates, LLC
Principal, Total Anesthesia Solutions, LLC

Overview

The Very Young
  – What makes a patient a pediatric patient?
  – How young is too young for surgery in an office setting?
  – What are some particular unique concerns?
  – You better have ......
  – Pediatric: accreditation, standards & training?

The Very Old
  – How old is too old?
  – We are all getting old – but what are the anesthesia implications?
  – Red flags

The Very Young
"Twice in the past few months I have had co-workers refuse to take care of patients (a small 14 year old and a good sized 16 year old) because the nurse was not PALS certified. We all have to have ACLS"
Ex-Premature Infant & Anesthesia

- Ex-premature infants
  - High incidence of coughing, pneumonia, stridor, and desaturation
  - Risk for apnea
    - <1% if postconceptual age ≥56 wk for gestational age ≥32 wk, and ≥54 wk for gestational age ≥35 wk
    - Risk for apnea higher for postconceptual age 51 wk (gestational age ≥32 wk) or 48 wk (gestational age ≥35 wk)
  - Caffeine
    - Prevents postoperative bradycardia, apnea, and periodic breathing, but use does not alter requirements (ie, postconceptual age) for ambulatory status
    - Small numbers of infants studied prevent recommendation for routine practice
  - Spinal anesthesia
    - Less incidence of apnea if sedation not given
    - But same requirements for postoperative monitoring and postconceptual age

Fisher DM. When is the ex-premature infant no longer at risk for apnea? Anesthesiology. 82:807-808, 1995.

Age & Ambulatory Anesthesia

- The ex-preemie recommendations for outpatient surgery
  - Wait until 60 wk postconceptual age to avoid added risk
- Full-term infants - discharge if:
  - Healthy
  - No significant physiologic changes or opioid requirement
  - Uncomplicated anesthetic
  - ≥1 mo of age, and >44 wk postconceptual age
  - Age limits based on comfort level of institution

“......There is no consensus regarding the minimum age and duration of monitoring for ambulatory anesthesia. Although there have been prospective studies examining risk factors for postoperative complications in the former PT, there are no studies looking at these risk factors in the FT. We looked at the current practice among ACGME accredited pediatric anesthesia programs and found wide variation....”

“......The majority of centers use a minimum PCA for outpatient surgery of 50-54 weeks (45%) followed by PCA >60 weeks F (26%) in PT (Figure I); 41-44 weeks (58%) in FT (Figure II). Several departments have no established policies for FT.....”

How young is too young for office based surgery?

- Very little data about term infants
  - No evidence supporting increased risk of sudden infant death syndrome (SIDS) from anesthesia unless sibling had history of SIDS or mother abused drugs during pregnancy
  - Limit outpatient practice for infants if providers and staff not experienced with infants <6 mo of age

Particular concerns of the very young

- URI
- Sleep apnea

Upper Respiratory Infection (URI)

- Children healthy 2 to 3 days preoperatively often present with URI day of surgery
- Reasons to postpone surgery
  - Children with acute, purulent URI, fever >38.5°C, or lower respiratory tract infection
Nonpurulent active URI (or within 4 wk)

- **Risks**
  - Decreased time to desaturation during apnea for children <1 yr of age
  - Hypoxemia, bronchospasm, and atelectasis increase with endotracheal intubation
  - Airway hyperreactivity exists for 6 wk after viral infection, with possible increased risk for laryngospasm (mixed data)
  - Postpone obviously ill children scheduled for elective surgery until well, if only for humane reasons (double effects of systemic illness and pain from surgery)
  - Consider whether child playing and interactive or showing obvious signs of malaise

**Study from New Zealand**

- **Established clinical predictors of complications**
  - Key adverse events included coughing, breath holding, desaturation, and laryngospasm
  - **Predictors of risk** — need for intubation
    - Parents or child complain of URI
    - Snoring (possible enlarged tonsils and difficulty with secretions)
    - Passive smoking (household member smokes >5 cigarettes/day)
    - Sputum with most productive cough, nasal congestion, induction with thiopental (as propofol), and failure to reverse muscle relaxation;
  - Nonpredictors of risk
    - URI in previous 6 wk period or previous cancellation for URI
    - Main predictors related to
      - Age, cough or airway secretions, and need for intubation;
  - **Conclusion**
    - Increased risk for children with URI by history, snoring, passive smoke exposure, nasal congestion, or productive cough;
    - Intubation increases risk (increased with laryngeal mask airway [LMA] or face mask);
    - Propofol presents lowest risk for intravenous (IV) induction;
    - Cancel nonurgent surgery if patient febrile, wheezing, suffering malaise, or <1 yr of age.

**Study from University of Michigan**

- **Compared active URI, URI within 4 wk, and healthy control patients**;
- **Surgery canceled for severe URI, lower respiratory tract infection, or bacterial infection**;
- **Adverse events included laryngospasm, bronchospasm, and breath holding**
- **Incidence of laryngospasm and breath holding same for all groups, but active or recent URI showed increased incidence of oxygen desaturation and overall adverse respiratory events**
- **Group with active URI or URI within 4 wk showed higher incidence of severe coughing, breath holding, and secretions**
- **Predictive factors**
  - Copious secretions, endotracheal intubation in children <5 yr of age, ex-prematurity, nasal congestion, parental smoking, history of reactive airway disease (RAD), and surgery involving airway (e.g., tonsillectomy)
  - **Conclusion**
    - Increased risk for children with active or recent URI with history of RAD, prematurity, exposure to environmental tobacco smoke, nasal congestion or copious secretions, or who require endotracheal intubation
  - **Anesthetic agent**
    - Lower incidence of problems with sevoflurane induction and maintenance
    - No increased mortality associated with elective procedures with careful management of anesthesia
    - For children with viral myocarditis, delay of procedure for active URI does not alter risk for fatal arrhythmias


Suggested Algorithm for children with URI

• Delay elective procedures 4 to 6 wk if symptoms of lower respiratory infection present or if ≤2 wk after lower respiratory symptoms, febrile, or ill-appearing
  – Determine if intubation required, and if other risk factors present consider delay
  – No hard and fast rules
    • Decision based on experience and provider comfort handling complications

Sleep Apnea

• Sleep-related breathing disorder with periodic cessation of air exchange
• Apnea episodes lasting >10 sec, apnea/hypopnea index (AHI) >5 episodes/hr
• Airflow cessation determined by auscultation or oxygen desaturation <92%

Types of sleep apnea

• Central
  – Neurologic etiology with failure of respiratory effort
• Obstructive
  – Most common (often associated with enlarged tonsils) with absent gas flow, upper airway obstruction, and paradoxical movement of ribcage and abdominal muscles
• Mixed
  – Common in children with trisomy 21
  – Combination of central and obstructive etiology

Obstructive sleep apnea syndrome (OSAS)

- Disturbed sleep and ventilation and episodes increase through night (with REM cycles)
- Occurs in 2% of children (3-7 yr of age most common)
- Occurs equally in boys and girls with higher incidence in black children
- Signs of OSAS
  - Daytime sleepiness, behavioral and learning disabilities, failure to thrive, speech disorders, enuresis, decreased release of growth hormone, chronic oxygen desaturation causing increased hematocrit and pulmonary vascular resistance (cor pulmonale) with evidence of right ventricular (RV) hypertrophy on electrocardiogram


Severity of OSAS

- Not related to actual size of tonsils
- Small pharyngeal air space associated with obesity, craniofacial anomalies, macroglossia, Pierre Robin syndrome, cleft palate, and neuromuscular disorders; children with Down syndrome present increased risk, with mixed form of sleep apnea


OSAS Anesthesia Implications

- No consensus regarding best method for induction
- Intravenous induction less peri-operative respiratory complications in the general pediatric population and recommended (by some authors) for patients with suspected difficult mask ventilation
- Children with OSAS had more complications during induction (supraglottic obstruction, oxygen desaturation, breath holding, require more than one attempt at intubation)
- Children with OSAS documented in the results of polysomnography should be admitted for inpatient, overnight monitoring if under the age of 3 years or have severe OSAS (apnea-hypopnea index of 10 or more events per hour, oxygen desaturation nadir less than 80%, or both). In addition, children with comorbidities listed below are not candidates for ambulatory surgery.
  - defects complications of OSAS (e.g., right ventricular hypertrophy)
  - craniofacial abnormalities
  - immunodeficiency disorders
  - cerebral palsy
  - Down syndrome
  - sickle cell disease
  - muscular dystrophy
  - prematurity
  - sickle cell disease
  - central hypoventilation syndrome
  - genetic/metabolic/storage disease
  - chronic lung disease
You better have…..

- ASA Statement on Practice Recommendations for Pediatric Anesthesia
- Society for Pediatric Anesthesia [http://www.pedsanesthesia.org/policyprovision.iphtml](http://www.pedsanesthesia.org/policyprovision.iphtml)
- American Academy of Pediatrics: Guidelines for the Pediatric Perioperative Anesthesia Environment [http://pediatrics.aappublications.org/content/103/2/512.full](http://pediatrics.aappublications.org/content/103/2/512.full)

You better have………proper equipment.

- Pediatric anesthesia equipment and Drugs: accessible and regularly maintained
- A resuscitation cart with equipment appropriate for pediatric patients of all ages admitted to the facility (including defibrillator paddles)
- Vasoactive resuscitative drugs and dantrolene sodium
- A written pediatric dose schedule for these drugs also should be immediately available.
- Airway equipment for all ages of pediatric patients admitted to the facility,
- Specialized equipment for management of the difficult pediatric airway by a variety of techniques for airway control, intubation and ventilation, including but not limited to specialized intubating devices and emergency cricothyrotomy sets
- Devices for the maintenance of normothermia
- Intravenous fluid administration equipment, including pediatric volumetric fluid administration devices, intravascular catheters in all pediatric sizes and devices for intraosseous fluid administration
- Appropriate sized noninvasive monitoring equipment as per ASA standards

ASA Statement on Practice Recommendations for Pediatric Anesthesia

You better have………proper staffing & PACU

- Anesthesiologist/Physician Staff
  - In order to apply specific expertise in the provision of pediatric anesthesia services, an anesthesiologist or other physician trained and experienced in pediatric perioperative care, including the management of postoperative complications and the provision of pediatric cardiopulmonary resuscitation, should be made immediately available to evaluate and treat any child in distress.
  - Pediatric advanced life support (PALS) certification or equivalent training is highly recommended for anesthesia and nursing staff caring for pediatric patients.
- Pediatric Anesthesia PACU Equipment and Drugs
  - In order to provide proximate availability of specialized pediatric equipment, the pediatric anesthesia equipment and drugs specified under the subtitle "Operating Room" (above) should be available for patients in the PACU.
  - Every child admitted to the PACU should have his or her vital signs monitored. Suction equipment and oxygen should be available at each bedside.
  - A respiratory oxygen delivery system should be available for use in the transport of infants and children from the operating room to the PACU…….

ASA Statement on Practice Recommendations for Pediatric Anesthesia
Pediatric: accreditation & training standards?

- ASA/SPA
- AAAHC/TJC

ASA/SPA

- Policies for the purpose of designating and categorizing the types of pediatric operative, diagnostic and therapeutic procedures requiring anesthesia on elective and emergent bases
- Stipulate the minimum level of ongoing clinical experience required in each category in order for the facility to maintain clinical competence in its performance.
- Examples of relevant criteria include patient age, patients with special anesthesia risks based on coexisting medical conditions and high-risk surgical procedures.
- Annual Minimum Case Volume for Anesthesiologists to Maintain Clinical Competence
- It is suggested that anesthesiologists providing care to pediatric patients at increased risk for anesthetic complications (thus requiring special clinical privileges) should be graduates of pediatric anesthesiology fellowship training programs accredited by ACGME or demonstrated continuous competence in the care of such patients as determined by the department of anesthesiology.

AAAHC/TJC

AAAHC

- "...The organization defines pediatric patients and has policies addressing the care provided and ensuring a safe environment through the provision of adequate space, equipment, supplies, medications and personnel..."
- "...When pediatric patients are served, health care professionals with documentation of current training in PALS and age and size appropriate resuscitative equipment must be available at all times until Pediatric patients operated on that day have been physically discharged. Also, if anesthesia services are provided to infants and children, the required equipment, medication, and resuscitative capabilities appropriate to pediatric patients are on site..."

TJC

- does not specify pediatric patient
- "...Staff are competent to perform their responsibilities also, The organization evaluates staff performance..."
The Elderly

• How old is too old?
• Perhaps mostly related to the magnitude of the procedure and person caring for the patient after they go home

“...In our study, the incidence of perioperative morbidity or mortality was 0.095% among 244,397 adult outpatients undergoing common day case-eligible surgical procedures, corresponding to 1 in 1,053 case. We identified seven independent predictors of perioperative morbidity or mortality when controlled for surgical complexity:......................”

Mathis et. al., Anesthesiology 2013; 119:1310-21

- Rational for ambulatory surgery
  - Recover in familiar surroundings
  - Less complications compared with if procedure done as an inpatient
  - Less expensive
- Physiologic and pharmacologic effects of aging
  - Organ function peaks at about age 40 years
  - Functional reserve preserved until about age 60 years
  - After age 60 years, wide variation on amount of reserve
    - The “physiology young” and “physiology old”


COPD
History of CVA or TIA
Obese BMI
Prior PCI/Cardiac Surgery
Prolonged Operative Time
Hypertension
Overweight BMI
Paraplegia/Quadriplegia
Cancer
Renal Failure/Dialysis Steroid Use
Age 81 - 90 years
CHF
Diabetes
Age 71 - 80 years
Male Gender
Underweight BMI
Age 41 - 50 years
Age 51 - 60 years
Age 61 - 70 years
Angina
Age 31 - 40 years
Alcohol Use

Figure 2. Theoretical changes in organ function over time as a percentage of maximal (optimal) young adult function for those who are considered “normal,” as well as those considered physiologically “young” or physiologically “old” (from Murovich, 2001, reproduced with permission).
Aging & Temperature

- BMR and temperature regulation
  - The BMR declines 1%–2% per decade from age 20 to 80 years
  - Aging combined with a decreased level of physical activity contributes to this decrease in BMR.
  - Shivering is less common in older patients because a lower core temperature must be reached to trigger a response
  - At increased risk for perioperative hypothermia


Aging & The Heart

- Cardiovascular effects
  - Stiffening of heart and vascular tree
  - Diastolic dysfunction
  - As risk for fluid overload


Aging & The Autonomic Nervous System

- Autonomic changes
  - SNS activities predominates later in life as PNS progressively declines
  - Beta receptors less responsive
  - Increased BP variability

Aging & The Lungs

- Pulmonary changes
  - Decreased lung compliance
  - Loss of parenchymal elasticity along with loss of chest wall compliance
  - Decreased VC, exp flow
  - Decreased respiratory response to hypoxemia and hypercapnia


Aging & The Kidneys/Liver

- Renal and hepatic changes
  - Renal
    - 30 to 50 % decrease in creatinine clearance between ages 20 and 90 years
    - Serum creatinine remains mostly normal due to decrease in creatinine production due to loss of muscle mass
  - Hepatic
    - 20 to 40 % liver mass decrease during typical human life span


Aging and The Brain

- Cerebral effects
  - Marked heterogeneity, but increase in cerebral atrophy and decrease in cerebral perfusion after age 60 years but there is marked variability
  - Perioperative side effects and complications
    - Postoperative delirium and cognitive dysfunction

Red Flags

- Postoperative care plans
  - People and the home
- The procedure
  - Fluid shifts
  - Will the procedure result in impaired ventilation?
  - Postop pain
- If the patient is not ambulatory, does the office have the personnel to move the patient?
Inhalational Anesthesia in the Office:
Best or Last Choice?

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Clinical Professor of Anesthesiology, UCLA School of Dentistry
Los Angeles, California

Disclosure

I have no significant financial interest or other relationships that could be considered a conflict of interest

The World of Office-Based Anesthesia

- Who? What? Where?
- What About Local Anesthesia?
- Inhalation vs. TIVA: Benefits & Liabilities
- Cost
- Recovery
- Emergencies
- Summary

SINCE WE ARE TALKING INHALATION

We can assume intubated/LMA general anesthesia. Which is commonly not the case.

Who’s The Surgeon?

- Physician?
  - Plastics vs. Ophthalmology vs. Urology vs. Dermatology, etc.
  - One Size Does Not Fit All!
- Dentist/Pediatric Dentist?
- Oral & Maxillofacial Surgeon?
- Podiatrist?
Who Are The Office Support Staff?
- Nurses?
- Physician Assistants?
- Medical Assistants?
- Dental Assistants?
- Oral Surgery Assistants?

What Is The Surgeon/Staff Training?
- BLS-HCP?
- ACLS?
- PALS?
- Are Certification Current?
  - Does The Training Mean They Can Help?

Who's the Patient?
- Pediatric?
- Young & Healthy?
- Older and Healthy?
- ASA II+ or III?
- Elderly

Who’s the Patient?
- Chronic Opioid and/or Benzodiazepine Use?
- Buprenorphine Use?
- Sleep Apnea/Obesity?

Where Are You?
- Well Equipped Office-based GA Facility?
- Surgical Sites Where Most Equipment Must Be Brought By Anesthesiologist
  - Procedure Room?
  - Dental Operatory?

What Equipment Is Available?
- Do You Have An Anesthesia Machine?
- Do You Have A Ventilator?
- What Are Your Choices If Not?
- Mobile Anesthesiologists Bring EVERYTHING Needed To The Office For Safe Anesthesia
  - That Is a Lot of Stuff!!
WHAT ABOUT LOCAL ANESTHESIA?

Intraoperative Postoperative

Medication Options

- Propofol
- Fentanyl
- Remifentanil
- Ketamine
- Sevoflurane
- Isoflurane

Inhalation vs. TIVA

- Inhalation
  - Sevoflurane vs. Isoflurane vs. Desflurane
  - ± Nitrous Oxide if scavenging easy
- TIVA
  - Propofol (LMA)
  - ± Nitrous Oxide if scavenging easy
  - Propofol/Remifentanil
  - Mixture vs. Two Pumps
Inhalation

**Benefits**
- Easy
- Predictable
- Complete Anesthetic
- Local Anesthesia Not Required
- Inhalation Induction Possible
- Cost?

**Liabilities**
- More Equipment
- Paralysis Needed?
- Opioids Needed?
- Emetogenic
- Ventilator?
- MH?
- Recovery?

Inhalation Induction

**Slow vs. Fast**
- How Do You Start The IV?
- Help During Intubation?

**TIVA: Propofol with Remifentanil**

**My Technique**
- Induction/Intubation
  - 2 – 3 mg/kg Propofol/Remi Slow!!
  - Adjust Remi Dose As Needed
- Maintenance Mixture in Propofol:
  - Children/Young Adults → 10 mcg/ml Remi
  - Middle Age → 5 mcg/ml Remi
  - Older → 2.5 - 4 mcg/ml Remi
  - Start 120 mcg/kg/min Based on Propofol
- Two Pumps
  - Adjustability; Start Remi at 0.05 mcg/kg/min

**Propofol/Remifentanil**

**Benefits**
- Hemodynamic Stability
- Antiemetic
- Rapid, Clear Awakening
- No MH Risk
- Minimal Equipment
**Propofol/Remifentanil**

**Benefits**
- Hemodynamic Stability
- Antiemetic
- Rapid, Clear Awakening
- No MH Risk
- Minimal Equipment

**Liabilities**
- Hypotension/ Bradycardia
- Chest Wall Rigidity?
- Good Local Anesthesia Helpful
- Ventilator?
- Cost?

**Ketamine?**

- Alternative to Inhalation Induction of Small Children
  - 3 mg/kg Ketamine/0.1 mg/kg Midazolam IM
  - Decreased Prop/Remi Requirement
- Propofol with Ketamine 1.25 - 2.5 mg/ml for Infusion
  - Better Hemodynamic Stability
  - Recovery Highly Variable
- Propofol with Bolus Ketamine
  - Best if good local anesthesa

**MUST IT BE EITHER INHALATION OR TIVA??**

- Iso, then Sevo or Des
- Inhalation with Remifentanil Infusion
- Inhalation Induction Followed By TIVA
- Inhalation Maintenance Followed By TIVA

**Cost – Inhalation**

- Isoflurane 250 ml = $18.00
- Sevoflurane 250 ml = $125.00
- Desflurane 240 ml = $195.00
- MAC for MAC
  - Iso $18 vs Sevo $250 vs Des $1000

**Cost – Inhalation**

- Isoflurane 250 ml = $18.00
- Sevoflurane 250 ml = $125.00
- Desflurane 240 ml = $195.00
- MAC for MAC
  - Iso $18 vs Sevo $250 vs Des $1000
  - Nitrous Oxide? Scavenging?

<table>
<thead>
<tr>
<th>Age</th>
<th>Desflurane O2 100%/N,0</th>
<th>Sevoflurane O2 100%/N,0</th>
<th>Isoflurane O2 100%/N,0</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5 yrs</td>
<td>7.3±0.1</td>
<td>2.6±0.1</td>
<td>1.3±0.2</td>
</tr>
<tr>
<td>4-6 yrs</td>
<td>5.2±1.7</td>
<td>2.3±1.1</td>
<td>0.0±0.0</td>
</tr>
<tr>
<td>70 yrs</td>
<td>5.2±1.7</td>
<td>2.3±1.1</td>
<td>0.0±0.0</td>
</tr>
</tbody>
</table>
Cost – TIVA
- Remifentanil = $60/1 mg
  - 100 kg at 0.075 mcg/kg/min = ~ 0.5 mg/hr
- Propofol = $4/20 ml vial
  - 100 kg at 100 mcg/kg/min = 60 ml/hr
- Cost Highly Variable Based on Weight
  - Clearly Very Low Cost In Young Children
- Does Not Take Into Account Waste!

Recovery
- Most Studies Show Desflurane Fastest Time to Awakening
- Discharge Times Similar for Desflurane/Sevoflurane/Propofol; Not Isoflurane
- Quality of Recovery Best with Propofol

Recovery
- These Studies Do NOT Translate To Office-based Practice!!!!
  - Anesthesiologist Is Frequently Recovery Professional
  - Most Important in OBA Is Time To Street Fitness
  - Emergence Agitation in Children With Sevoflurane!!!
  - Multimodal Post-op Pain Control
    - Bupivacaine, Acetaminophen, NSAIDs, Opioids

Emergencies
- How Are You Going to Manage MH?
  - Ryanodex: Game Changer?
- Laryngospasm on Mask Induction Before IV?
- Vomiting on Mask Induction Before IV?
- Do You Bring Your Own RN/AA/EMT-P?

Inhalation: Best of Last Choice
- No Right Anesthetic In All Situations
- Each Technique Has Advantages and Disadvantages
- Combining Techniques May Minimize Liabilities of Each
  - And Reduces Cost of TIVA in Adults
- The Ability To Achieve Good Local Anesthesia Can Not Be Underestimated

INHALATION IN OBA: BEST OF LAST CHOICE
Tailor the Anesthetic To The Patient, Not the Patient To The Anesthetic
THANK YOU
Office-based surgery: Safety Review

Richard D. Urman, MD, MBA
Harvard Medical School
Brigham and Women's Hospital
Department of Anesthesiology, Perioperative and Pain Medicine
Boston, MA

*No conflicts of interest

Outline

- Safest place
  - The Controversy
  - The Literature
  - The Bottom Line

Outline

- Safest place
- Safest anesthetic
  - The Controversy
  - The Literature
  - The Bottom Line
Outline

- Safest place
- Safest anesthetic
- Safest credentials

The Controversy
The Literature
The Bottom Line

Statistics - 2007

- American Society for Aesthetic Plastic Surgery
- 11.7 million cosmetic procedures in USA (surgical and non-surgical)
  - 457% increase since 1997
- 10+ million all elective surgical procedures (2005)
  - Doubled from 1995
- OBS is estimated to represent 17-24% of all elective ambulatory surgery

The Bottom Line:
Education
Cosmetic Surgery Trends
Surgical and Nonsurgical Cosmetic Procedures: Totals
Source: American Society for Aesthetic Plastic Surgery

The top five surgical procedures:

Aesthetic surgery:
- Liposuction
- Breast augmentation
- Eyelid surgery
- Abdominoplasty
- Breast reduction

All, as reported in NACOR database
- Colonoscopy
- Knee arthroscopy
- Hysteroscopy
- Oocyte retrieval
- Upper GI endoscopy

Statistics (aesthetic surgery) - 2007
Which is the safest place?

a) office
b) ambulatory surgicenter
c) hospital
d) All the above

The Controversy

Vila et al.
Arch Surg 2003;138:991-995 - Tampa, Florida

- Study to compare outcome to determine patient safety between offices and ASC
- All adverse incidents reviewed (April 2000 – April 2002)
- Approximately **10-fold** increased risk of adverse incident and death in an office based setting
Coldiron et al.

- To analyze surgical incidents in office based settings in Florida: March 2000 – March 2003
- Prospective study refuted Vila’s data
- No increased risk of death from office procedures
- The greatest risk to patients in an office based setting is a cosmetic procedure under General Anesthesia

The Literature

Office-Based Anesthesia: Safety and Outcomes
Fred E. Shaper, DC; Nathan Pryor, MD; Nath M. Rosenberg, MD; Arnolda Kaland, MD; Rebecca Neerly, MD; MPH; and Richard D. Urrutia, MD, MBA

The increasing volume of office-based medical and surgical procedures has fostered the emergence of office-based anesthesia. The growth of OBA has been facilitated by numerous technical, including technological advances in medical and surgical procedures and anesthesia, along with increased provider reimbursement and greater convenience for patients. There is a lack of randomized controlled trials to determine how office-based procedures and anesthesia affect patient outcomes and morbidity. As a result, the experience of anesthesia professionals has become the only available information about the safety of office-based procedures and anesthesia. However, more recent data have shown that office-based anesthesia is comparable to hospital and preoperative surgery centers. There are fewer complications and morbidity rates are documented. Although the evidence continues to expand, the safety of office-based anesthesia remains an important concern. This review article is designed to address the safety of office-based anesthesia and incorporate patient safety initiatives and professional safety guidelines into practice. These changes require ongoing collaboration and commitment to improving patient care and outcomes in the office setting. It will examine the literature and provide recommendations for improving patient safety initiatives for OBA and future developments that could impact the field.
Office Based Safety and Plastic Surgery

<table>
<thead>
<tr>
<th></th>
<th>Morello et al</th>
<th>Keyes et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Cases</td>
<td>400,675</td>
<td>411,670</td>
</tr>
<tr>
<td>Complications (%)</td>
<td>0.47</td>
<td>0.33</td>
</tr>
<tr>
<td>Hemorrhage (%)</td>
<td>0.24</td>
<td>0.18</td>
</tr>
<tr>
<td>Infection (%)</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Death (%)</td>
<td>0.0017</td>
<td>0.002</td>
</tr>
</tbody>
</table>

Keyes et al.
Plastic and Reconstruct Surg 2004;113:1760
Plastic and Reconstruct Surg 2008;122:245

- AAAASF – the first internet-based quality improvement and peer review program to analyze outcomes for surgicenters it accredits
- >1 million procedures (2001–2006)
- Peer review- every 6 months of random cases and unanticipated operative events
Office Based Safety and Plastic Surgery

<table>
<thead>
<tr>
<th></th>
<th>Keyes et al 2008</th>
<th>Keyes et al 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Cases</td>
<td>1,141,418</td>
<td>411,670</td>
</tr>
<tr>
<td>Complications (%)</td>
<td>0.00202</td>
<td>0.00194</td>
</tr>
<tr>
<td>Hemorrhage (%)</td>
<td>0.33</td>
<td>0.18</td>
</tr>
<tr>
<td>Infection (%)</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>Death (%)</td>
<td></td>
<td>0.00194</td>
</tr>
</tbody>
</table>

Keyes et al. 2008 Causes of death

13/23 deaths from PE (57%)

The Bottom Line
Which is the safest anesthetic?

a) General Anesthesia / Deep Sedation
b) Conscious Sedation
c) Local Anesthesia
d) All the above
Coldiron B, et al. 

- Coldiron et al concluded that the increased risk of death due to **general anesthesia being performed in the office**
- “Liposuction under general anesthesia deserves continued scrutiny because deaths due to this procedure continue to occur and this procedure can be performed with dilute local anesthesia, with no deaths reported.”

The Literature

- Hoefflin et al: 23,000 plastics procedures under GA - no deaths or significant complications
- Perrott et al: 34,391 pts oral/maxillofacial - complication rate 1.3%; 0.4% - LA, 0.9% - CS, and 1.5% - GA
- Bitar et al: 4778 plastics procedures under IV sedation - no deaths; 12 complications - PONV most common
**Ramon Y et al.**
Ther Drug Monit 2007; 29:644-647.

**Liposuction: NOT a Trivial Procedure**

- Most common surgical cosmetic procedure
- 2007 → 456,361 cases
- "Tumescent Anesthesia" - SC infiltration of NS with 0.1% lidocaine + 1:1,000,000 epi
- Fat aspiration
- Major concerns: lidocaine toxicity, pulmonary/fat embolism, fluid overload, hypothermia

---

**Treatment of cardiac arrest with fluid resuscitation:** (approximate doses are given in ml for a 70kg patient)
- Give intravenous bolus injection of normal saline (NS) 500 mL over 1 min
- Give any further bolus of NS 500 mL over 1 min
- Continue CPR
- Start an intravenous infusion of intralipid® 20% at 0.35 mL/kg/min
- Give a dose of atrovent over 30 sec
- Recheck the cardiac output at 1 min intervals if an adequate circulation has not been restored
- Give a bolus of 100 mL 5% dextrose over 30 sec if the cardiac output has not been restored
- Continue CPR
- Continue intravenous fluid and atrovent until adequate circulation has been restored

---

**ASA/SAMBA Task Force**
Office Based Anesthesia: Considerations for Anesthesiologists in Setting up and Maintaining a Safe Office Anesthesia Environment (2008)

---

**What makes an ideal sedative agent?**

- rapid onset and recovery
- amnestic, anxiolytic
- sedative-hypnotic
- analgesic
- minimal effect on cardiovascular and respiratory system
- no post-operative nausea and vomiting
What makes an ideal sedative agent?

- To date no single agent has all these properties
- A combination of propofol, midazolam, ketamine, alpha-2-agonists, anti-histamines, local anesthetics and opioids can achieve the desired effect.
- The benefit of drug combinations is the synergy and decreased potential for side effects.

ASA Closed Claims Analysis:
MAC Cases – Bhananker et al, 2006

- MAC claims involved older and sicker patients compared with general anesthesia claims
- More than 40% of claims associated with MAC involved death or permanent brain damage, similar to general anesthesia claims
- Respiratory depression - most common mechanism (21%)
- 46% deemed preventable by:
  - better monitoring eg. capnography
  - improved vigilance
  - audible alarms

MAC → TIVA

- We are challenged by the variety of interpretations of the term “MAC anesthesia”
- The patient prefers NOT to be completely asleep
- The surgeon requests that the patient be nonverbal, non-mobile, and pain-free
- Our dilemma occurs when we find ourselves providing TIVA without an endotracheal tube
American Society of Anesthesiologists Task Force
Anesthesiology 2008; 108:786–801

- Practice Advisory for the Prevention and Management of Operating Room Fires

Operating Room Fires Algorithm

#1 Avoid using ignition source in proximity to oxidizer-enriched atmosphere.

#2 Configure surgical drapes to minimize accumulation of oxidizers.

#3 Allow sufficient drying time for flammable skin prep solutions.

#4 Moisten sponges/gauze when use in proximity to ignition sources.

The Bottom Line
Which is the safest anesthetic?

a) General Anesthesia / Deep Sedation
b) Conscious Sedation
c) Local Anesthesia
d) All the above

The Safest Credentials

The Controversy

Is board certification adequate?
What does board-certified mean?

Are practitioners doing something other than what their board certification qualifies them to do?

Should there be some type of regulation on advertising or false representation of credentials?

Because a dermatologist has hospital privileges to perform excisions on the breast, should he or she also be performing larger breast surgery?

Should oral surgeons, family practitioners be performing breast operations?

Should gynecologists, otolaryngologists be performing face lifts, abdominoplasties, and liposuction?

Should hospital credentialing committees be more stringent on whom they allow to perform certain procedures in the hospital?
The Literature

Determining the Safety of Office-Based Surgery: What 10 Years of Florida Data and 6 Years of Alabama Data Reveal

Alabama: 3 deaths and 49 procedure-related complications and hospital transfers. All occurred in offices of board-certified physicians.

- Cosmetic procedures were responsible for 42% of hospital transfers and no deaths.
  - 86% percent of hospital transfers that were caused by a cosmetic procedure involved the use of GA.

Florida: 46 deaths and 263 procedure-related complications and hospital transfers

- Cosmetic procedures liable for at least 50% of deaths and hospital transfers.
- Liposuction and liposuction with abdominoplasty or other cosmetic procedure caused 10 deaths and 34 hospital transfers.
- 93% of offices reporting an adverse event had physicians with board certification, and 98% of them had physicians with hospital privileges.
Despite conflicting reports regarding the safety of office-based surgery, adverse event reporting should be uniform in order for large scale studies to correctly assess the risk. Until this is done, no definitive conclusions can be drawn. Opinion may be swayed by anecdotes and sensationalism in the media.

Since systematic data collection on outcomes of pediatric dentistry is lacking, authors examined media reports of pediatric deaths that occurred in the context of dental sedation or anesthesia. Children who died after receiving anesthesia for a dental procedure (1980–2011).

Most deaths: 2–5 year-olds (n = 21/44), in an office setting (n = 21/44), and with a general/pediatric dentist (n = 25/44) as the anesthesia provider. For general/pediatric dentists: 17 of 25 (68%) deaths linked with a sedation anesthetic. Paper grouped dental and MD anesthesiologists together.

Key Messages:
Imperative to be able to track anesthesia-related adverse outcomes.

The Bottom Line
Office-based surgery should be performed by properly trained physicians working within their scope of practice.

Certified anesthetists or anesthesiologists should administer anesthesia and carefully monitor patients.

Uniform reporting of adverse events and mortality

In the absence of a gold standard of randomized prospective trials, office-based surgery is safe and cost-effective.

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Safety by Educating the Public

The Controversy

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“When flawed studies are reported to the public or quoted in the literature, the results tend to become gospel and are almost impossible to dislodge from the forum of public discussion” eg. silicone controversy
Safety by Educating the Public
Clayman MA, et al.
Ann Plast Surg. 2007; 58: 288–291

Suggestions:
- Physicians critically read any medical literature that are read by the public or touted in media.
- Patients should research education, training, certification of person performing the procedure.
- Patients should ask: Do they have surgical privileges to perform the same procedure in an accredited hospital?

The Bottom Line

Education =

Patient Safety
ASA CLOSED CLAIM PROJECT

Liability with Office-Based Cases

Domino, Kib: Office-Based Anaesthetic Lessons Learned from the Closed Claims Project. ASA Newsletter 65(6): 9-11, 15, 2001

2013 UPDATE: ASA Closed Claims

ASA Abstract, 2013 Annual Meeting

Twersky, et al.

- 1996-2011: OBA=64; other outpatient claims=716.
- OBA claims more likely to involve plastic surgery procedures (45%) vs. other outpatient claims.
- Most OBA claims involved respiratory or equipment adverse events.
- Most common adverse event leading to injury in OBA:
  - inadequate ventilation or oxygenation (17% vs. 6% other outpatient).
  - electrocautery fires occurred in 9% of OBA claims (same as other outpatient).
- Permanent damage/death outcomes did not differ between groups,
  - death in 27%; permanent disabling injury in 17%.
- Care was more commonly substandard in OBA claims (52% vs 37%).
- OBA claims were more likely to result in payment (72% vs 56%).
- But payments similar between OBA (median $135,800) vs. other outpatient ($211,500).

Death less common in recent OBA claims vs. earlier report

Substandard care remains unchanged
Injuries in Dental Claims
(compared to all anesthesia claims)

- Death: 47% (vs. 26%)
- Severe brain damage: 7% (vs. 9%)
- Nerve damage: 3% (vs. 22%)
- Airway injuries: 10% (vs. 7%)
- Esophagus: 2%
- Nose: 3%
- Vocal cord: 4%

Data from Karen Domino, MD

Effect of an Office-Based Surgical Safety System on Patient Outcomes

- 28-element perioperative ISOBS checklist
- Customized to an office-based plastic surgery
- 219 cases
- Baseline and post-op adverse outcomes
- Post-checklist implementation chart review

Additional Goals:
- To decrease incidence of adverse outcomes in the perioperative period
- To educate the practitioner and support staff

Office Surgical Checklist Pilot Study
Study Results

- **Pre-checklist, 90%** missing documentation of **three or more elements**.
- **15%** of cases had **adverse events** of which pain (3.7%) and bleeding/bruising (3.2%) were most common.
- **Post-checklist analysis:** **90-100% increase in documentation** of several key indicators and practices.

**Results** of survey: greater awareness of patient safety issues following participation in simulation and debriefing exercises in 3 areas (p < 0.05):
- **The need to change processes if there is a recognized patient safety issue** (100% vs 75%),
- **Openness to ideas about improving office processes** (100% vs 88%),
- **Need to discuss ways to prevent errors from recurring** (88% vs 62%).

**Conclusions:** Issues of safety and regulatory compliance can be assessed in a office-based setting through the short-term (half-day) use of in-situ simulation with facilitated debriefing and the review of audiovisual recordings by trained facilities inspectors.
Barriers to the implementation of checklists in the office-based procedural setting.

Shapiro FE1, Fernando RJ, Urman RD

Harvard Medical School and Beth Israel Deaconess Medical Center, Boston, Massachusetts.


19 question, cross sectional prospective survey
25 offices; 38 responses; 50% used checklists
Barriers: 77% no incentive, 44% no mandate, 33% time consuming, 33% lack of training
Incentives: 36% regulatory mandate, 26% evidence-based research

Table 1: Anesthesia type in OA compared with non-OA MACOR cases

<table>
<thead>
<tr>
<th>Variable</th>
<th>Office-Based OA = 48,486 (100)</th>
<th>MACOR 77 = 9,166,158 (100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anesthesia Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EP</td>
<td>19.3 (20)</td>
<td>85.3 (102)</td>
</tr>
<tr>
<td>GA</td>
<td>65.1 (91)</td>
<td>4,564,620 (96.3)</td>
</tr>
<tr>
<td>LOC</td>
<td>4,15 (7)</td>
<td>1,899 (3.7)</td>
</tr>
<tr>
<td>MAC</td>
<td>7,748 (23.0)</td>
<td>1,167,301 (21.8)</td>
</tr>
<tr>
<td>SED</td>
<td>16.0 (16)</td>
<td>968,777 (18.6)</td>
</tr>
<tr>
<td>Total</td>
<td>28,493 (58.0)</td>
<td>19,642,123 (58.0)</td>
</tr>
</tbody>
</table>

P = 0.001

Abbreviations: OA, oral and oral; GA, general anesthesia; LOC, local anesthesia only; SED, other SED, regional anesthesia.
Questions?

NACOR
(National Anesthesia Clinical Outcomes Registry)

Initial Results from the National Anesthesia Clinical Outcomes Registry and Overview of Office-Based Anesthesia

Table 1: Age distribution of CSA and non-CSA NACOR cases

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Office-Based CSA (%)</th>
<th>NACOR CSA (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>1.23 (0.14)</td>
<td>4.85 (0.32)</td>
</tr>
<tr>
<td>1-4</td>
<td>8.37 (1.29)</td>
<td>1.50 (0.19)</td>
</tr>
<tr>
<td>5-9</td>
<td>5.98 (1.48)</td>
<td>4.17 (0.30)</td>
</tr>
<tr>
<td>10-24</td>
<td>32.84 (4.21)</td>
<td>3.20 (0.13)</td>
</tr>
<tr>
<td>25-49</td>
<td>2.94 (0.17)</td>
<td>2.05 (0.10)</td>
</tr>
<tr>
<td>50+</td>
<td>3.15 (0.13)</td>
<td>8.96 (0.12)</td>
</tr>
</tbody>
</table>

Why Did They Die in Cosmetic Surgery?

New reports on failures in patient care at prestigious Manhattan Eye, Ear and Throat Hospital.
A death after liposuction exposes busy illegal clinic
Couple from Brazil held in Framingham

By Liz Kowaleski and Brian R. Ballou

FRAMINGHAM — The young Brazilian women and their family members who went to a beauty parlor for cosmetic surgery in Brazil last year say they were sold a fake product that led to a medical emergency.

They said they were told to bring cash, as much as $2,000, Over the last several years, according to law enforcement officials and customers, a Brazilian couple ran an illegal cosmetic surgery clinic from a condominium, sedating patients with anesthetics and then attempting to perform out-of-office procedures.

The woman, Ana Maria Miranda Ribeiro, 40, had traveled between Brazil and Massachusetts, and she is one of the first to be held in Framingham.

Their business, which apparently was common knowledge among many in Framingham’s Brazilian community, spread from Sunday night after the death of a young Brazilian woman and her

числен

ThursdayStyles

Beauty on the Black Market

Most of the operations were done at a salon near the family home and were carried out by volunteers.

The family said they were told they would be charged for the operation, but instead were given a check for $3,000.

The salon, run by the couple, was closed down on Saturday night after the death of a young Brazilian woman and her

числен

Initial Results from the National Anesthesia Clinical Outcomes Registry and Overview of Office-Based Anesthesia

Table 1: Initial Results from the National Anesthesia Clinical Outcomes Registry and Overview of Office-Based Anesthesia

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Number of Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected outcome in PACU</td>
<td>7</td>
</tr>
<tr>
<td>Unplanned event in PACU</td>
<td>3</td>
</tr>
<tr>
<td>Self-injury event</td>
<td>2</td>
</tr>
<tr>
<td>Unplanned hospital admission</td>
<td>1</td>
</tr>
<tr>
<td>Unexpected PACU event</td>
<td>1</td>
</tr>
<tr>
<td>Adverse drug reaction</td>
<td>1</td>
</tr>
<tr>
<td>No anesthetic given</td>
<td>3</td>
</tr>
<tr>
<td>Confusion/confusion</td>
<td>2</td>
</tr>
<tr>
<td>Reversal of action</td>
<td>1</td>
</tr>
<tr>
<td>Adverse effect</td>
<td>1</td>
</tr>
<tr>
<td>Adverse event</td>
<td>1</td>
</tr>
<tr>
<td>Adverse complication</td>
<td>1</td>
</tr>
<tr>
<td>Adverse event</td>
<td>1</td>
</tr>
<tr>
<td>Adverse complication</td>
<td>1</td>
</tr>
<tr>
<td>Adverse event</td>
<td>1</td>
</tr>
<tr>
<td>Adverse complication</td>
<td>1</td>
</tr>
</tbody>
</table>

числен
Drug Shortages: How they are affecting the Office-Based Practitioner

Zak Messieha
Dentist Anesthesiologist
Clinical Professor: University of Illinois at Chicago

253 critical drug shortages in 2011, 75% of which were injectable products in 2011.
56% failure of quality management.
7% quality management failure in one drug lead to shortage in another.
9% discontinuation due to low-average revenue.
28% other (plant closure, low raw materials).
Quality issues: glass, metal, bacteria, endotoxins and mold contamination.
Contracted products in an industry that has shrunk 15% between 2007 and 2009 primarily due to Medicare Modernization Act affecting profit margins.
**Drugs Impacting Anesthesia Care 2013-2014**

- Atropine
- Dexamethasone
- Epinephrine
- Etomidate
- Fentanyl
- IV Solutions
- Ketorolac
- Lorazepam
- Midazolam
- Morphine
- Nalbuphine
- Ondansetron
- Propofol
- Succinylcholine
- Sufentanil

---

**How Do We Navigate It?**

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**Multi-Approach**

- **Administrative:** Multi-vendor diversification. Finger on the pulse.
- **Clinical:** Modifying usual techniques involving drugs in shortage.

---

**http://www.nac.state.fl.us/rgts/drugshortages**
**Alternative Agents**

- Methohexital
- Etomidate
- Ketamine
- Propofol
- Fentanyl
- Alfentanil
- Remifentanil
- Ketamine/Propofol
- Remifentanil/propofol
- Remifentanil/methohexital
- Remifentanil/ketamine
- Dexmedetomidine

---

**Methohexital**

- Incremental doses as needed
  - 10 mg to 20 mg
  - Continuous infusion
  - 50-100 mcg/kg/min
  - Procedures 1-5 hours or less (high redistribution)
- Histamine Release:
  - Reactivation
  - Coughing
  - Tachycardia
  - Tachycardia
- “Stimulants and/or twitching (Revel®/Stust®)"
- Pain on injection (2%)
- Increased incidence of phlebitis (8%)

---

**Ketamine**

- Pharmacokinetics
- Peak plasma concentration
  - 1 minute IV
  - 5 minutes IM
  - 30 minutes oral
- Redistribution
  - 15 minutes IV
- 30 - 120 minutes IM
- 1-2 mg/kg IV
- 4-6 mg/kg IM
- 2-3 mg/kg IM “stun dose”
- Incremental doses for sedation
- 10-20 mg intermittent bolus as needed
Ketamine/Propofol (Ketofol)

- Combination of ketamine/propofol
- 1:1
- Dose 0.5-1 mg/kg for GA induction
- No bolus for sedation
- Onset 30 seconds
- Maintenance 0.05-2 mcg/kg/min
- Ultrashort acting
- Ester linkages result in rapid hydrolysis by nonspecific esterases
- Sedation doses 0.05-0.1 mcg/kg/min

Remifentanil (Ultriva®)

- Dose 0.5-1 mcg/kg for GA induction
- No bolus for sedation
- Onset 30 seconds
- Maintenance 0.05-2 mcg/kg/min
- Ultrashort acting
- Ester linkages result in rapid hydrolysis by nonspecific esterases
- Sedation doses 0.05-0.1 mcg/kg/min

Remifentanil/Propofol

- Propofol and remifentanil as separate infusions:
  - Propofol 50 – 150 mcg/kg/min
  - Remifentanil 0.05 – 0.1 mcg/kg/min
- Propofol and remifentanil combined in a single syringe:
  - 100 mcg of remi in 200 mcg of propofol
  - 5 mcg/ml remifentanil
  - Infuse as you would propofol alone and adjust to patient response

Remifentanil/Propofol vs Ketofol

Remifentanil/propofol
- 5 mcg/ml and 10 mcg/ml
- Ketamine/propofol
- 2.5 mcg/ml and 10 mcg/ml
- Initial priming boluses of 500 mcg/kg and 500 mcg/kg
- Additional 200 mcg/kg bolus as needed to obtund
  painful reflex
- Maintenance with 100 mcg/kg/min continuous infusion
- 20 mg intermittent boluses of propofol as needed.


Both combinations produced satisfactory sedation as rated by surgeon and patient

- No difference in PONV between the groups
- Ketamine group had a 6.6 minute longer emergence
- Ketamine group had twice as long recovery time
- Addition of ketamine did not conserve propofol as compared with remifentanil

Remifentanil/Methohexital

Remifentanil and methohexital as separate infusions
- Remifentanil 0.05 – 0.1 mcg/kg/min
- Methohexital 50 – 150 mcg/kg/min

Remifentanil and methohexital combined in a single syringe
- 100 mcg of remi in 200 mg of methohexital
- 5 mcg/ml remifentanil

Infuse as if it is methohexital alone and adjust to patient response and respiratory rate.
Sufentanil
Dose: 25-2 mcg/kg
• Onset 30 seconds
• Maintenance 0.5-1.5 mcg/kg/hr
• Additional boluses 2.5-10 mcg
• Ultrapotent
• Respiratory depression
• Sedation doses
Dilute to final concentration of 5 mcg/ml
5 mcg sufentanil is equivalent to 50 mcg fentanyl

Alfentanil
Dose 25 mcg
• Onset 30 seconds
• Maintenance 0.5-2 mcg/kg/min
• Less potent than fentanyl
• Sedation doses • 500 mcg alfentanil is equivalent to 50 mcg fentanyl
**Precedex** (-dexmedetomidine)

- 16α2-α2 agonist.
- Sedation.
- Analgesia.
- HR/BP control.
- Minimal effect on respiratory drive.

**Dexmedetomidine**

- Loading dose:
  - 1 mcg/kg over 10 min
- Maintenance infusion:
  - 0.2 to 0.7 mcg/kg/hr
  - Administer using a controlled infusion device
- Slow controlled bolus:
  - 0.25 mcg/kg
- No respiratory depression
- Stabilizes cardiovascular stress response
- Controls emergence delirium
- Infusion should be discontinued 20-30 minutes prior to end of procedure to enhance recovery time

**Precedex**
Propoven??

“Unapproved” propofol formulation temporarily approved by the FDA
- Propoven is manufactured in FDA-approved facilities by Fresenius Kabi AG, the parent company of APP
- Preservative-free
- Contains medium- and long-chain triglycerides
- Propofol contains only long-chain triglycerides, EDTA
- 6% solution same as propofol

Fospropofol

Water-soluble prodrug of propofol
- Endothelial cell alkaline phosphatases hydrolyze prodrug to release propofol
- Slower onset and longer duration
- No injection pain
- Adverse reactions
- Perineal itching, burning, tingling in up to 85%

Fospropofol

Distribution half-life: 6.5 minutes
- Elimination half-life: 46 minutes
- Supplied as 35 mg/ml

Dosing
- IV bolus: 6.5 mg/kg
- Supplemental prn doses: 1.6 mg/kg
- Use this dosing in patients 18-64 years and 60-90 kg
- In patients <60 kg, dose as 60 kg
- In patients >90 kg, dose as 90 kg
- In patients >65 years and/or ASA 3 or 4, give 75% of standard dose
**Etomidate**

- Short-acting IV anesthetic for induction and maintenance for short procedures
- Similar in profile to thiopental
- Induction 0.2-0.6 mg/kg (0.3 mg/kg)
- Incremental bolus doses • 2-4 mg as needed

**Etomidate**

- Burns upon injection.
- High incidence of N/V
- Myoclonic movements and hypertonicity
- Hiccough
- Histamine release?
DISCLOSURES:

NO CONFLICTS OF INTEREST

Objectives:
1. Discuss the evolution and growth of guidelines and regulations for office-based surgery and anesthesia.
2. Discuss categories of guidelines and regulations and selected state examples.
4. Clinical Registries and reporting
Definition of OBA:
OBA Committee 2010

“Office-Based Anesthesia (OBA) is defined as anesthesia services provided in a facility that primarily serves as a location for routine patient visits. Surgical and/or diagnostic procedures are performed in such a location, and patient visits may or may not be related to the surgical or diagnostic procedures performed under anesthesia (but are exclusive of the procedures themselves). Designs and set up of such facilities vary greatly, and generally exclude ASCs as licensed by many states.

General categories of guidelines and regulations in medical/surgical offices:

- Training
- Patient selection
- Patient evaluation
- Anesthesia
- Office setting
- Emergency planning
- Follow-up care
- Quality improvement
- Facility Accreditation

http://library.fsmb.org/pdf/GPOLL_Office_Based_Surgery
General categories of guidelines and regulations for anesthesiology in dental offices:

- Permits/Licensing
- Training and Education
- Office/Facility inspection rules and guidelines
- Equipment and Drugs
- Personnel
- Documentation

Regulatory Bodies for OBA/OBS:

- Federal government (e.g., Center for Medicare and Medicaid Services, Drug Enforcement Agency, Food and Drug Administration)
- State legislature/government
- Township/local government
- Federation of State Medical Boards
- State Dental Boards
- Dental Assisting National Board (particularly sedation care by dental assistants)

Bodies with Oversight and/or Policy Statements and/or Guidelines/Standards for OBA/OBS:

- American Dental Association
- Academy of General Dentistry
- American Academy of Pediatric Dentistry
- American Academy of Periodontology
- American Association of Oral and Maxillofacial Surgeons
- American Dental Society of Anesthesiology
- American Dental Hygiene Association
- Society of Ambulatory Anesthesia
- American Society of Anesthesiologists

Guidelines and Regulations-Trends:

- Decreased oversight and regulation relative to growth
- Great regional variation with respect to OBA regulations
- Requirements for licensing vary from none to strict
- Requirements for accreditation vary from voluntary to mandatory, and in content:
  - The Joint Commission
  - Accreditation Association for Ambulatory Healthcare (AAAHC)
  - American Association for Accreditation of Ambulatory Surgery Facilities (AAAASF)
States have statues, regulations and guidelines for office-based medical/surgical facilities meeting various thresholds:

AL, AK, AZ, CA, CO, CT, FL, GA, IL, IN, KS, KY, LA, MD, MA, NJ, NC, NY, NV, OH, OK, OR, SC, TN, TX, VA, WA

http://library.fsm.org/pdf/GRPOL_Office_Based_Surgery

Oversight and Regulations:
- Examples-cont’d

FL: The Board of Medicine adopts the “Standards of the American Society of Anesthesiologists for Basic Anesthetic Monitoring,” approved by House Delegates on October 21, 1986, and last amended on October 21, 1998, as the standards for anesthetic monitoring by any qualified anesthesia provider”.

“These standards apply to general anesthetics, regional anesthetics, and monitored anesthesia care (Level II and III as defined by this rule) although, in emergency circumstances, appropriate life support measures take precedence.”
Oversight and Regulations

Examples

LA: “All facilities shall have an auxiliary source of oxygen, suction, resuscitation equipment and medication for emergency use. A cardiopulmonary resuscitative cart shall be available and shall include, but not be limited to, an Ambu Bag, laryngoscope, emergency intubation equipment, airway management equipment, a defibrillator with pediatric paddles if pediatric patients are treated and a medication kit which shall include appropriate non-expired medication for the treatment of anaphylaxis, cardiac arrhythmia, cardiac arrest and malignant hyperthermia when triggering agents are used or if the patient is at risk for malignant hyperthermia. Resources for determining appropriate drug doses shall be readily available.”

All 50 States have anesthesia permits, and/or statues and/or regulations and guidelines dental facilities meeting various thresholds

- Nitrous Oxide
- Parenteral Sedation
- Deep sedation/General anesthesia


[Map of the United States with states colored green, indicating all states have rules and regulations.]
Rules and Regulations information:

- [http://library.fsb.org/pdf/GRPOL_Office_Based_Surgery.pdf](http://library.fsb.org/pdf/GRPOL_Office_Based_Surgery.pdf)
- [http://asdahq.org](http://asdahq.org)

Objectives:

- Overview of benchmarking and quality management in the office-based practice
- Clinical Registries and reporting
DHHS: National Quality Strategy to improve the quality of health care

Three aims:

1. better care that is patient-centered, reliable, accessible, and safe
2. healthy people in healthy communities
3. reduced costs

National Strategy for ambulatory surgery

1. appropriate patient selection to avoid excessive rates of unanticipated admission or readmission
2. identification and avoidance of rare but serious adverse events
3. minimizing side effects such as PONV and pain, to support an early return to functional status.

ASCs → OBS?

- Beginning in 2012, CMS phased in a new-quality reporting program.
- For ASCs:
  - G-codes (ex: fall, burn, admission, abx timing, wrong side)
  - Already existing reportable quality measures
  - New provision for surgical volume tracking
  - The use of safe surgery checklists
- ASCs required to report on these last 2 measures beginning in 2013.
- If ASCs fail to report the required quality measures, they will face a 2% reduction in their Medicare payments.
- Additional reportable quality measures (influenza vaccination coverage among health-care professionals) may be added in the near future.
Patient Satisfaction Surveys

- AHRQ, CAHPS Consortium, CMS, developed standardized surveys to collect data on patient’s care experiences/ratings

- CMS has already implemented CAHPS surveys for health and drug plans, hospitals, and home health agencies.

- Am. College of Surgeons developed a “CAHPS Surgical Care Survey,” which includes items about communication with the anesthesiologist

- In 2013 CMS initiated the development of a standardized hospital outpatient surgical department/ASC Experience of Care Survey
Accreditation Agencies Quality Initiatives

- AENEID: during each AAAHC survey 700 data points are generated, a large resource of information on ambulatory health-care accreditation.
- Determine standards in which organizations have difficulty, develop educational tools, train surveyors.
- AENEID can be utilized by facility in response to regulations requiring performance measurement data showing evidence-based practices.

Steps to create an anesthesia QM and benchmarking program

- Continuous improvement in outcomes is a professional obligation of all anesthesiologists.
- What is not measured cannot be improved
  - data collection is critical to quality management in anesthesia.
- Participation in national registry efforts (SCOR, NACOR)
  - allows to benchmark performance against other practices and providers.
- Reporting outcome data is a sensitive topic, and must be customized for each practice and each piece of information.

Steps to create an anesthesia QM and benchmarking program

<table>
<thead>
<tr>
<th>Essential steps in creation of an anesthesia QM program</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Designate a single individual to lead the effort</td>
</tr>
<tr>
<td>- Recruit interested participants from the practice</td>
</tr>
<tr>
<td>- Collect and investigate sentinel cases</td>
</tr>
<tr>
<td>- Collect structured data for every case from billing and medical record systems</td>
</tr>
<tr>
<td>- Collect relevant clinical outcomes (may require creating new data capture tools)</td>
</tr>
<tr>
<td>- Benchmark practice performance to internal trends and external peers</td>
</tr>
<tr>
<td>- Identify outliers in the data, and determine why</td>
</tr>
<tr>
<td>- Create reports for the public, for facility leadership, for the practice, and for individuals</td>
</tr>
<tr>
<td>- Make changes to improve care</td>
</tr>
<tr>
<td>- Repeat continuously</td>
</tr>
</tbody>
</table>
What data to collect?

(often less accessible)

- Administrative issues
- Case cancelled
- Case delayed (list reasons)
- Ongoing PACU discharge (list reasons)
- Safety issues
- Major complications (list)
- Unplanned admission or emergency room transfer
- Minor adverse events (corneal abrasions, dental injury, and so forth)
- Patient experience
- Overall satisfaction
- Satisfaction with anesthesiologists
- Occurrence of postoperative nausea or vomiting
- Adequacy of pain management

OUTCOME INDICATORS FOR OFFICE-BASED AND AMBULATORY SURGERY

Committee of Origin: Ambulatory Surgical Care

(Approved by the ASA House of Delegates on October 16, 2013)

Outcome Tray:
- All patients within 24 hours
- 30-day follow-up after discharge

Complications are common:

- Central nervous system or peripheral nervous system nerve defect
- Need for emergency surgery
- Severe hypotension
- Unplanned intubation
- Pulmonary atresia of native heart

Pain issues:

- Malignant
- Local
- Nerve lesions
- Nerve damage

Postoperative:

- Blood transfusion
- Hospital-acquired infection
- Heart attack
- New neurological deficit
- Persisting pain

Preoperative:

- Unplanned preoperative treatment in physician’s office or emergency department
- Unplanned admission to hospital or acute care facility
- Cardiopulmonary arrest or death
How to Use QM Data

- Must be turned into information for clinicians, through analysis and reporting
- QM officer/committee should decide on the best way to report data
- Purely private information? Metrics shared with the department/group? Reports for public consumption?
- Reporting customized to specifics of the practice, patients, public climate

NATIONAL ANESTHESIA CLINICAL OUTCOMES REGISTRY

- AQI, founded by the ASA, sponsors:
  - incident-reporting framework (Anesthesia Incident Reporting System)
  - National Anesthesia Clinical Outcomes Registry (NACOR)
- Accepts any electronic data
  - with the minimum data set being that available from billing data.
- 300+ practices and 1000+ facilities, representing 9000+ providers and 20+ million cases!
- Much of the information is descriptive: age, ASA status, type of anesthesia, and surgical duration.
Currently contains over 121,000+ ambulatory/oba anesthesia cases. Retrospective data from 2008, prospective from 2009+.

Initial findings: overall low incidence of PONV, but significant incidence in certain case types.

A subset of cases shows opportunity for the improvement in postoperative pain management.

Incidence of serious complications is extremely low.

Allows participants to see their outcomes vs. aggregated data for similar case types.

Other registries

The Society for Pediatric Anesthesia (SPA)

- Wake Up Safe reported clusters of events: wrong-side surgery/ regional anesthesia, medication errors, and hyperkalemia from transfusion.

SPA also sponsors the Pediatric Regional Anesthesia Network (14,000+ regional blocks)

Pediatric Sedation Research Consortium: 131,000 sedation cases with good overall safety.

SCOR OBA outcomes relate primarily to case specialty - 2014

- GYN cases have a high incidence of PONV and PDNV
  - There is a surprising amount of variability between providers and between centers
  - Basic PONV guidelines are not followed a surprising amount of time

- Dental cases have a higher incidence of respiratory events than other types of cases
  - The majority of dental cases submitted are classified as OBA
  - Further evaluation is needed to determine factors other than the type of surgery

Source: Lucy Everett, MD
### Respiratory events in SCOR Dental Cases - 2014

<table>
<thead>
<tr>
<th>Event</th>
<th>All Dental Cases</th>
<th>Dental OBA</th>
<th>All SCOR Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>11386</td>
<td>10054</td>
<td>116737</td>
</tr>
<tr>
<td>Death</td>
<td>0 [0%]</td>
<td>0 [0%]</td>
<td>2 [0.02%]</td>
</tr>
<tr>
<td>Cardiac arrest</td>
<td>0 [0%]</td>
<td>0 [0%]</td>
<td>2 [0.02%]</td>
</tr>
<tr>
<td>Aspiration</td>
<td>3 [0.01%]</td>
<td>1 [0.01%]</td>
<td>8 [0.01%]</td>
</tr>
<tr>
<td>Dental trauma</td>
<td>0 [0%]</td>
<td>0 [0%]</td>
<td>6 [0.01%]</td>
</tr>
<tr>
<td>Difficult airway, unrecognized</td>
<td>6 [0%]</td>
<td>5 [0%]</td>
<td>14 [0.01%]</td>
</tr>
<tr>
<td>Malignant hyperthermia</td>
<td>0 [0%]</td>
<td>0 [0%]</td>
<td>1 [0%]</td>
</tr>
<tr>
<td>Reintubation</td>
<td>2 [0.02%]</td>
<td>2 [0.02%]</td>
<td>3 [0.02%]</td>
</tr>
<tr>
<td>Laryngospasm</td>
<td>36 [0.31%]</td>
<td>35 [0.35%]</td>
<td>50 [0.04%]</td>
</tr>
<tr>
<td>Bronchospasm</td>
<td>8 [0.07%]</td>
<td>7 [0.07%]</td>
<td>24 [0.02%]</td>
</tr>
<tr>
<td>Hypoxia</td>
<td>10 [0.08%]</td>
<td>9 [0.09%]</td>
<td>26 [0.02%]</td>
</tr>
</tbody>
</table>

Source: Lucy Everett, MD

---

**Example of a Practice-specific SCOR Report**

[Graphical representation of SCOR data]

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**SCOR Outcomes Report by Specialty**

[Detailed SCOR report with data tables and graphs]

---

**SCOR Outcomes Report by Specialty**

[Detailed SCOR report with data tables and graphs]
Obesity and Obstructive Sleep Apnea
Adults vs Peds: Management in the Office Based Surgical and Anesthesia Setting

Fred E. Shapiro, DO
Assistant Professor of Anesthesia
Harvard Medical School
Beth Israel Deaconess Medical Center
Department of Anesthesia, Critical Care, and Pain Medicine
Boston, MA

Disclosures
- Founder, Institute for Safety in Office Based Surgery (ISOBS), non-profit, multidisciplinary organization to promote patient safety through education, ISOBS surgical safety checklist, enlisting data outcome reporting, develop evidenced based clinical standards, and uniform legislation in USA

OSA
- Most common sleep disorder
- Combination: Upper airway obstruction and Decreased SP02
- 10-20% adult population
- 80% undetected
- Anesthetic challenge: proper patient selection
- ASA/SAMBA guidelines
Risk Factors
- Between 30-70: male 14%, female 5%
- Anatomic abnormalities: craniofacial, macroglossia, retrognathia, endocrine (eg Cushing), connective tissue (eg Marfan)
- Age > 50
- Neck Circumference > 40cm
- Lifestyle: alcohol, smoking

Co-morbidities
- Myocardial ischemia
- Hypertension, arrhythmias, heart failure
- cerebrovascular disease
- metabolic
- insulin resistance
- GERD
- obesity

Diagnosis
- Gold standard: Sleep study
- AHI index: average number of respiratory events/hour of sleep
- Apnea: cessation airflow 10 sec
- Hypopnea: reduced airflow with SPO2 decrease > 4%
- AASM: AHI > 15 or AHI > 5 with sx
- AHI: 5-14 mild, 15-30, mod, > 30 severe
Preoperative Screening

- Sleep study – costly, time consuming
- ABG and polysomnography: differentiate between OSA, obesity hypoventilation syndrome, central sleep apnea
- ASA 2006 Task Force-practice guidelines
- ASA Checklist
- Berlin questionnaire
- STOP-BANG questionnaire -2008

ASA Guidelines 2006

- Severity of OSA
- Invasiveness of surgery
- Type of anesthesia
- Postoperative opioid requirement
- Score=0-9
- <3 may undergo ambulatory surgery

ASA Risk Assessment Scoring System

<table>
<thead>
<tr>
<th>Severity of sleep apnea</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0</td>
</tr>
<tr>
<td>Mild</td>
<td>1</td>
</tr>
<tr>
<td>Moderate</td>
<td>2</td>
</tr>
<tr>
<td>Severe</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Invasiveness of surgery and anesthesia</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superficial surgery/local anesthetic and no sedation</td>
<td>0</td>
</tr>
<tr>
<td>Superficial surgery/moderate sedation or general anesthetic</td>
<td>1</td>
</tr>
<tr>
<td>Peripheral surgery with regional anesthetic and moderate sedation</td>
<td>1</td>
</tr>
<tr>
<td>Peripheral surgery with general anesthetic</td>
<td>2</td>
</tr>
<tr>
<td>Airway surgery with moderate sedation</td>
<td>2</td>
</tr>
<tr>
<td>Major surgery/general anesthetic</td>
<td>3</td>
</tr>
<tr>
<td>Airway surgery/genera anesthetic</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Requirement for postoperative opioids</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0</td>
</tr>
<tr>
<td>Low-dose oral opioids</td>
<td>1</td>
</tr>
<tr>
<td>High-dose oral, parenteral, or neuraxial opioids</td>
<td>3</td>
</tr>
</tbody>
</table>

Berlin Questionnaire

1. Do you snore?
   a. Yes
   b. No
   c. Don’t know
   If you snore:
2. Your snoring is:
   a. Slightly louder than breathing
   b. As loud as talking
   c. Louder than talking
   d. Very loud — can be heard in adjacent rooms
3. How often do you snore?
   a. Nearly every day
   b. 3–4 times a week
   c. 1–2 times a week
   d. 1–2 times a month
   e. Never or nearly never
4. Has your snoring ever bothered other people?
   a. Yes
   b. No
   c. Don’t know
5. Has anyone noticed that you quit breathing during your sleep?
   a. Nearly every day
   b. 3–4 times a week
   c. 1–2 times a week
   d. 1–2 times a month
   e. Never or nearly never

Category 2:

6. How often do you feel tired or fatigued after your sleep?
   a. Nearly every day
   b. 3–4 times a week
   c. 1–2 times a week
   d. 1–2 times a month
   e. Never or nearly never
7. During your waking time, do you feel tired, fatigued, or not up to par?
   a. Nearly every day
   b. 3–4 times a week
   c. 1–2 times a week
   d. 1–2 times a month
   e. Never or nearly never
8. Have you ever nodded off or fallen asleep while driving a vehicle?
   a. Yes
   b. No
   If yes:
9. How often does this occur?
   a. Nearly every day
   b. 3–4 times a week
   c. 1–2 times a week
   d. 1–2 times a month
   e. Never or nearly never

Category 3:

10. Do you have high blood pressure?
    a. Yes
    b. No
    c. Don’t know

ASA Checklist

Category 1: Predisposing Physical Characteristics
   a. BMI > 35 kg/m²
   b. Neck circumference > 43 cm/17 inches (men) or 40 cm/16 inches (women)
   c. Craniofacial abnormalities affecting the airway
   d. anatomical nasal obstruction
   e. Tonsils nearly touching or touching the midline

Category 2: History of Apparent Airway Obstruction during Sleep
   Two or more of the following are present (if patient lives alone or sleep is not observed by another person, then only one of the following need be present):
   a. Snoring (loud enough to be heard through closed door)
   b. Frequent snoring
   c. Observed pauses in breathing during sleep
   d. Awakens from sleep with choking sensation
   e. Frequent arousals from sleep

Category 3: Somnolence
   One or more of the following are present:
   a. Frequent somnolence or fatigue despite adequate sleep
   b. Falls asleep during nonstimulating environment (e.g., watching TV, reading, riding in or driving a car) despite adequate sleep
   c. Parent or teacher comments that child appears sleepy during the day, is easily distracted, is overly aggressive, or has difficulty concentrating (pediatric only)
   d. Child often difficult to arouse at usual awakening time (pediatric only)

STOP-BANG Questionnaire

Snooring - Do you snore loudly (louder than talking or loud enough to be heard through closed doors)?
Tired - Do you often feel tired, fatigued, or sleepy during daytime?
Observed - Has anyone observed you stop breathing during your sleep?
Blood Pressure - Do you have or are you being treated for high blood pressure?
BMI - more than 35 kg/m²?
Age - over 50 yr old?
Neck circumference - greater than 40 cm?
Gender - male?
Obstructive Sleep Apnea (OSA)

- Use of STOP-Bang criteria for preoperative OSA screening
- Consider patient co-morbidities in selection process.

STOP-Bang screening tool for OSA risk

- Snoring: Do you snore loudly (scream or loud enough to be heard through closed door)? Yes/No
- Rashness: Do you stop breathing (apnea) 5 or more times per hour? Yes/No
- Risk factors: Do you have a body mass index (BMI) of 35 kg/m² or greater? Yes/No
- Apnea: Are you a sleep apnea suspect? Yes/No
- Patent Safety (BMI or age)
- Lack of compliance: Frequent

Also consider:
- Co-morbidities (arrhythmias, CHF, cerebrovascular dys)
- Level of invasiveness of surgery and anesthesia
- Potential need for post-op opioids

SAMBA: OSA and Ambulatory Surgery outcomes

- 2 prospective cohort, 5 retrospective chart
- General, ortho, lap bariatric, upper airway
- 1491 - OSA, 2036 - low risk, 2095 - no OSA
- No clinically significant adverse outcomes
  - Eg surgical airway, anoxic brain injury, delayed discharge, unanticipated hospital admission
- YES : appropriate pt selection, periop care
SAMBA:OSA and Ambulatory Surgery outcomes

- Study limitations; use to guide clinical care
- Varied methods to dx OSA: sx, screening, questionnaire, administrative ICD9 code
- Control group- no sleep study; dx by asx
- Difference in definition:
  - Hypoxemia = < 95%, < 90%, need for O2
  - Difficult airway= increased DL attempt, grade view

Obstructive Sleep Apnea (OSA)

- Dx OSA+ Compliant with CPAP; optimized co-morbidities
- Screening tool: Presumed dx + optimized co-morbidities, postoperative pain relief by non-opioid techniques
- Laparoscopic upper abdominal procedures (eg gastric band) with perioperative considerations
- No guidance for upper airway procedures

SAMBA:OSA and Ambulatory Surgery outcomes

- OSA- higher BMI, higher IDDM, HTN, stroke, myocardial infarct, CHF
- OSA- postop hypoxemia; no difference for vent assist or need for reintubation
- OSA-increase laryngoscopy attempts, difficulty in view grade, increase use FOB
- OSA- increase use metoprolol, labetolol, ephedrine, no difference unanticipated admissions
Patients With Non-optimized Comorbid Conditions Not Suitable For Ambulatory Surgery may benefit from diagnosis and treatment of Obstructive Sleep Apnea (OSA).

- Pre-procedure surgeon, patient and family education re: increased vigilance, potential complications
- Bring CPAP to facility, encourage few days and nights after procedure
- Sleeping in a semi-upright position postoperatively
- Precaution against use of opiates
Perioperative Precautions and Risk Mitigation

Seet and Chung. Can J Anesthesia; 57: 849-64

Intraoperative, non-opioid, multi-modal technique
- Local, regional anesthesia
- Moderate sedation - capnography
- Deep sedation procedures - consider secure vs unprotected airway
- GA - short acting agents; extubate awake, semi-upright position

Obstructive Sleep Apnea (OSA)
- Intraoperative: non opioid multimodal; local/regional anesthesia; NSAID; cox-2 inhibitors; gabapentin; ketamine; dexmedetomidine; dexamethasone
- Moderate sedation - capnography
- Deep sedation procedures - consider secure vs unprotected airway
- GA - short acting agents; extubate awake, reversal neuromuscular blockade, semi upright position

Postoperative Care: OSA and GA
- Post aldrete criteria, extend monitoring for 60 min and admission
- SPO2 < 90%, RR < 8 breaths/min, apnea>10 sec, pain/sedation mismatch
- ASC - transfer agreement w inpt facility
- Surgeon/Anesthesia agree with plan
- Education: alternative to opioid analgesia eg cox 2 inhibitors, acetaminophen, NSAID
- CPAP day/night; semi-upright @ home

Society for Ambulatory Anesthesia Consensus Statement on Preoperative Selection of Adult Patients with Obstructive Sleep Apnea Scheduled for Ambulatory Surgery

Postoperative management of the pt with diagnosed or suspected OSA

Diagram showing management strategies for diagnosed and suspected OSA.

- **Diagnosed OSA**
  - Moderate/Severe OSA (AHI>15) or
  - Noncompliance with PAP therapy or
  - Significant comorbidities or
  - Recurrent PACU Respiratory Events

- **Suspected OSA**
  - High risk for surgical morbidities
  - History of obstructive sleep apnea

**STOP BANG** criteria:
- **S**core: ≥ 5
- **T**hroat size
- **O**verweight
- **P**eripheral edema
- **A**rterial hypertension
- **G**enital hypoplasia
- **N**on-compliance with PAP

**Features Comparing Adult vs Pediatric OSA Syndrome**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Children</th>
<th>Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>2–6 yr peak</td>
<td>Increased elderly</td>
</tr>
<tr>
<td>Gender</td>
<td>Male = female</td>
<td>Males &gt; females</td>
</tr>
<tr>
<td>Obesity</td>
<td>Rarely enlarged</td>
<td>Common</td>
</tr>
<tr>
<td>Daytime sleepiness</td>
<td>Less common than in adults</td>
<td>Common</td>
</tr>
<tr>
<td>Sleep obstruction</td>
<td>Obstructive apnea or hypoventilation</td>
<td>Obstructive apnea</td>
</tr>
<tr>
<td>Sleep architecture</td>
<td>Increased delta and REM</td>
<td>Decreased</td>
</tr>
<tr>
<td>Arousals</td>
<td>May not be seen</td>
<td>At end of each apnea</td>
</tr>
<tr>
<td>Treatment</td>
<td>Surgery</td>
<td>CPAP or surgery</td>
</tr>
<tr>
<td>Medical</td>
<td>Selected patients</td>
<td>Most common therapy</td>
</tr>
<tr>
<td>OSA in children younger than 1 yr of age was excluded</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Perioperative management of children with obstructive sleep apnea

Schwengel DA, Sterri LM, Tunkel DE, Heitmiller ES.
Anesth Analg. 2009 Jul;109(1):60-75

- **OSA syndrome** 1%-3% of children.
- **Adenotonsillectomy** - most common surgical treatment
- 2006 ASA Practice guideline for perioperative management of patients with OSA - risk factor: obesity, adenotonsillectomy in children< 3 yr.
- Management of OSA in children younger than 1 yr of age was excluded.
Diagnosis and management of childhood obstructive sleep apnea syndrome


- (1) All children/adolescents screened for snoring.
- (2) Polysomnography should be performed in children/adolescents with snoring and symptoms/signs of OSAS; if polysomnography is not available, alternative diagnostic tests or specialist for further eval
- (3) Adenotonsillectomy is the first-line treatment of patients with adenotonsillar hypertrophy.
- (4) High-risk patients should be monitored as inpatients postoperatively.

- (5) Patients should be reevaluated postoperatively for further treatment esp high risk or have persistent sx
- (6) Continuous positive airway pressure is recommended if adenotonsillectomy not performed or OSAS persists postoperatively.
- (7) Weight loss is recommended therapy for overweight or obese.
- (8) Intranasal corticosteroids are an option for children with mild OSAS in whom adenotonsillectomy is contraindicated or for mild postoperative OSAS.

Symptoms and Signs of Obstructive Sleep Apnea

- Frequent snoring (3 or more nights/week)
- Labored breathing during sleep
- Gasp/snorting noises/observed apneas
- Sleep enuresis (especially secondary enuresis)
- Sleeping in the seated position or with the neck hyperextended
- Cyanosis
- Headaches on awakening
- Daytime sleepiness
- Attention-deficit/hyperactivity disorder
- Learning problems
### Congenital and Medical Conditions associated with OSA Syndrome:

- Achondroplasia
- Cerebral palsy
- Choanal stenosis
- Cleft palate post repair
- Down's Syndrome
- Hypothyroidism
- Obesity
- Pierre robin syndrome
- Treacher collins syndrome
- Sickle cell disease

---

### Contraindications for Adenotonsillectomy

**Absolute contraindications**
- No adenotonsillar tissue

**Relative contraindications**
- Very small tonsils/adenoids
- Morbid obesity and small tonsils/adenoids
- Bleeding disorder refractory to treatment
- Submucous cleft palate
- Other medical conditions making the patient medically unstable for surgery

---

### Risk Factors for Postoperative Respiratory Complications in Children with OSA Undergoing Adenotonsillectomy

- Age younger than 3 years
- Severe OSA on polysomnography
- Cardiac complications of OSA
- Failure to thrive
- Obesity
- Craniofacial anomalies
- Neuromuscular disorder
- Current respiratory infection
Perioperative management of children with obstructive sleep apnea
Schwengel DA, Sterni LM, Tunkel DE, Heitmiller ES.
Anesth Analg. 2009 Jul;109(1):60-75

Algorithm for risk assessment and disposition planning
Case # 1 : A routine day in GI

Learning Objectives: # 1

Describe the anesthetic management of ‘healthy’ teenager undergoing ERCP in an ambulatory setting.

Patient # 1

- P.T. is a 18 year-old female with abdominal pain presents for an ERCP due to biliary stone
- You are requested to perform MAC anesthesia for the procedure.

Patient # 1

- Height 71”
- Weight 310 lbs (BMI=43.3)
- BP 125/74
- Pulse 70
- RR 16
- Temp 36.7
- R/A \( O_2 \) Sat = 98%

Physical Examination

- She is alert and oriented x3
- Airway exam:
  - Mallampati class II airway
  - Mouth opening ( >3 fingerbreadths)
  - intact upper and lower teeth
  - Full ROM neck
  - Prognathism normal

Learning Objectives: Case # 2

Describe the anesthetic management of an adult with multiple co-morbidities undergoing GI endoscopy in an ambulatory setting.
P.T. is a 47 year-old male who presents for a flexible upper endoscopy for unexplained 60 lb weight loss
You are requested to perform MAC anesthesia for the procedure.

Case #2: A simple GI endoscopy....

Patient #2

- Height 72"
- Weight 348 lbs (BMI=45.64)
- BP 135/61
- Pulse 96
- RR 20
- R/A O2 Sat = 95%

PMH:
- Chronic renal failure; s/p transplant 2006, recent elevated creatinine, abdominal pain, weight loss
- Morbid obesity
- Obstructive sleep apnea, home BiPAP
- CAD s/p CABG 2005, EF= 40%, Paroxysmal A fib
- Hypertension
- Thrombocytopenia
- Hyperparathyroidism s/p gland resection 7/30/14
- IDDM w neuropathy FBS=127
- Chronic LE venous stasis ulcers

Meds:
- Lisinopril 40 mg
- Glargine 17 units q hs
- Omeprazole
- Simvastatin
- Aspirin 81mg daily
- Prednisone
- Sodium bicarbonate
- Sulfameth/Trimethoprim
- Oxycodone
- Magnesium/calcium supplement
- Metoprolol
- azothioprine

Physical Exam

- He is alert and oriented x3
- Airway exam:
  - large thick tongue
  - Mallampati class IV airway
  - mouth opening (>3 cm)
  - Hyomental distance > 3cm
  - intact upper and lower teeth
  - thick neck, chin: measured 25 inches
  - beard
  - limited neck extension secondary to a posterior neck tissue
Learning Objective: # 3

Describe the anesthetic management of an adult with multiple co-morbidities undergoing an outpatient MRI.

Patient # 3

- RD is a 48 year-old male with chronic leg pain presents for an MRI of his right hip.
- He complains of hoarseness, sore throat, and requests MAC anesthesia.
- “I don’t want a tube down my throat!”

Meds:
- Omeprazole
- Neurontin 600 mg tid
- Lorazepam
- Baclofen
- Albuterol
- Hydromorphone 4mg q 3 hours
- Methadone 40 mg tid
- Tizanidine 8 mg qid
- Lasix
- Sulfameth/Trimethoprim
- Oxycodone
- Magnesium/calcium supplement

Patient # 3

- Height 69”
- Weight 320 lbs (BMI=45.64)
- BP 135/61
- Pulse 96
- RR 20
- R/A O₂ Sat = 95%
Patient # 3

**PMH:**
- h/o IVDA, cocaine, Hep C
- Morbid obesity, Obstructive sleep apnea, no CPAP
- Wheelchair bound; no CP/SOB upon self wheeling
- Suprapubic catheter in place
- Anxiety/Claustrophobia
- Since last MRI, c/o hoarseness, difficulty swallowing solid food, “like grapefruit getting stuck in my throat”
- Hypertension
- Asthma; COPD, smoking
- Chronic leg pain

**PSH:**
- May 2010 epidural abscess C5-T1, intubated OSH to BIDMC ICU, trach, multiple surgeries I and D, anterior - posterior instrumentation, bacteremia, vertebral osteomyelitis, lifetime bactrim, recurrent MRSA
- Recent total body MRI 6/30: LMA 5, dex 40 mcg, PPF @ 140 gtt/kg/min
- Recent suprapubic catheter placement - no anesthesia records

**Physical Exam**
- He is awake, alert, anxious, irritable requesting MAC. “I don’t want a tube down my throat. I need MRI for hip pain!”
- **Airway exam:**
  - large thick tongue
  - Mallampati class IV airway
  - mouth opening (>3 cm)
  - Hyomental distance > 3 cm
  - intact upper and lower teeth
  - thick neck, chin: measured 25 inches
  - beard
  - Limited/ minimal neck extension secondary to c spine instrumentation, posterior neck tissue

---

**Can this case be performed?**

**Is this patient a suitable candidate for MAC anesthesia? Why? Why not?**

**What are the alternatives?**

**What type of anesthesia will you use?**

**Any airway concerns?**
Patient and Procedure Selection in the Office

Stephen R. Smith, MD

Preoperative Patient Selection for OBA

- Patient Physiologic State
- Patient Psychologic State
- Post Anesthesia Recovery needs and duration
- Post Discharge Care Environment
- Inherent Risk of Procedure/Anesthetic Complications

Patient Physiologic State

- ASA Class
  - ASA 1 and 2
    - Generally acceptable for all office situations
    - Scheduled by established protocol
      - Pre-op telephone interview desirable
  - ASA 3 and 4
    - Requires anesthetologist evaluation
    - Degree of physiologic trespass by planned procedure
    - Ophthalmic procedures relatively benign
**Patient Physiologic State**

- **Chronic Systemic Disease**
  - Is patient's condition medically optimized?
  - Consultation with relevant consultant
  - Statement of optimization
  - Will the condition interfere with planned procedure?
    - Chronic cough and ophthalmic procedure
  - Will surgical procedure exacerbate the condition?
    - Airway surgery with existing OSA

- **Acute conditions concomitant to planned procedure**
  - Operative site infection, lesion or derangement
    - Planned procedure will resolve condition
    - Delaying procedure will worsen condition

- **Acute conditions with no relation to planned procedure**
  - Procedure will neither improve nor resolve condition
  - Exacerbation of chronic systemic condition
  - Acute systemic infection

**Acute Systemic Infection: Upper Respiratory Infection**

- Viral Rhinitis or Something Else?
  - Children have 6-8 URI's per year
  - Increased airway reactivity for 4 weeks after URI (kids at risk half the year)
    - Laryngospasm
    - Bronchospasm
    - Post Extubation Croup
    - Oxygen Desaturation
Patient Physiologic State

- Cancellation/Rescheduling not without risk
  - Progression of underlying disease process
  - Economic impact
  - Insurance Preauthorization
  - Parental work issues
  - Logistical expense
  - Practitioner

- Blanket Cancellation Policy no longer viable
  - Which patients should be rescheduled 4 weeks later?

Patient Physiologic State

- Uncomplicated URI: Proceed with caution
  - Avoid intubation if possible

- Severe or Complicated URI: Reschedule 4 weeks later
  - Fever ≥ 38°C (100.4°F)
  - Mucopurulent nasal discharge or sputum
  - Cough
  - Leukotriene (looks like kid)
  - Smoke exposure
  - Comorbidities
    - Asthma
    - Cardiac
    - OSA

Patient Physiologic State

- Bacterial Infections and Antibiotic Therapy
  - Infection associated with procedure
    - Abscessed tooth for extraction
    - Continue antibiotics
    - Fever should not delay procedure
  - Unrelated Infection
    - Delay until resolved if possible

- Prophylactic Antibiotics
  - SCIP "Guidelines"
  - Infectious Endocarditis Prophylaxis
  - Joint Prosthetic Prophylaxis
American Dental Association/American Heart Association joint guidelines
- Patients who might benefit from Infectious Endocarditis antibiotic prophylaxis
  - Prosthetic valves
  - Prior endocarditis
  - Cardiac transplant with valvulopathy
  - Congenital heart defect with:
    - Incompletely repaired cyanotic lesion
    - Residual anomaly adjacent to prosthetic graft

American Dental Association/American Academy of Orthopedic Surgeons joint guidelines
- Literature review found “...no direct evidence that dental procedures cause orthopaedic implant infections.”
- 1. The practitioner might consider discontinuing the practice of routinely prescribing prophylactic antibiotics for patients with hip and knee prosthetic joint implants undergoing dental procedures.
- 2. We are unable to recommend for or against the use of topical oral antimicrobials in patients with prosthetic joint implants or other orthopaedic implants undergoing dental procedures.
- 3. In the absence of reliable evidence linking poor oral health to prosthetic joint infection, it is the opinion of the work group that patients with prosthetic joint implants or other orthopaedic implants maintain appropriate oral hygiene.

Congenital Anomalies
- Airway Related
  - Anatomically difficult intubation
    - Hemifacial Microsomia (Goldenhar)
    - Robin Sequence (Pierre-Robin)
    - Treacher Collins
  - Surgical repair resulting in difficult intubation
    - Nasal intubation after Cleft Palate Repair with Pharyngoplasty
Patient Physiologic State

- **Congenital Anomalies**
  - Cardiac Lesions
    - Acyanotic (may include Left to Right Shunt)
    - ASD/VSD/PDA: probably OK for OBA
    - What does the echo show?
    - What does cardiologist say?
    - Coarct/AS/AV Canal: probably NOT
    - Cyanotic (includes Right to Left Shunt)
      - NO
      - HELLO

Patient Psychologic State

- **Cognitive Disability precludes routine care**
  - (probably why you were invited to the party)
- **Autism Spectrum Disorders**
- **Developmental Delay**
- **Associated Anatomic Abnormalities**
  - (is this part of a syndrome?)
    - Trisomy 21 and atlantoaxial instability, cardiac anomalies
- **Physically Challenging Anesthetic**
  - Potential for physical trauma to patient and/or providers

Patient Psychologic State

- **Induction of Anesthesia**
  - Stealth and Cunning vs Speed and Surprise
  - **Inhalation Induction**
    - Develop rapport with parents +/- patient
    - Premedication: Midazolam oral or nasal
    - Parental presence for induction/unconventional techniques
    - Usually limits to general anesthesia for procedure
  - **Intramuscular Ketamine/Versed**
    - Typically unannounced
    - Allows IV start and potential for IV sedation instead of general anesthesia
Inherent Risk of Procedure/Anesthetic Complications

- Deep Venous Thrombosis/Pulmonary Embolus
  - 40+ years old
  - History of DVT/PE
  - Coagulation abnormalities
  - Hypercoagulable states
  - Estrogen
  - 3+ pregnancies
  - CHF
  - Cancer
  - Obesity
  - Trauma
  - Limited ambulation
  - Pelvic RT
  - Recent long distance travel

Post Anesthesia Recovery needs and duration

- Office PACU care must meet ASA Standards
- Recover in place vs transport to specified area
  - Method of transport, will cart fit through doors?
- Procedure specific special recovery needs
  - Monitoring (OSA)
  - Duration (does case length allow sufficient recovery time?)
  - Equipment (water cooling pads)
  - Therapy (cast application)
  - Pain control

Post Anesthesia Recovery needs and duration

- Discharge
  - Physician always responsible for determining suitability for discharge
  - Discharge by criteria
    - Modified Aldrete Score:
      - Score greater than 9
    - Fast-Tracking Criteria: adds pain and nausea evaluation
      - Score greater than 7
  - Physician must remain in office until patient meets criteria
  - BLS/ACLS trained person must remain until patient has left the building

- Recover in place vs transport to specified area
  - Method of transport, will cart fit through doors?
  - Procedure specific special recovery needs
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Procedure Selection for OBA

- **Federal Regulations**
  - CMS
  - OSHA, CLIA, ADA, DEA

- **State Regulations**
  - State Medicaid
  - 23 states require OBA

- **Professional Society Recommendations**
  - Focused and relevant

- **Individual Practitioner Determination**

- **Professional Liability Insurance Coverage**

---

**Individual State Regulations**

- **Facility Accreditation**
  - 16 states have some requirement
  - RI: apply within 9 months/cert by 24 months
  - NC: should substantially comply

- **Physician supervision of CRNAs**
  - 20 states, some from other statutes
  - Only CT, KS, MS and OR do not require
    (*opt out states*)

- **CME for surgeons supervision CRNAs**
  - 6 states
  - SC encourages surgeons to obtain anesthesia CME

---

**Individual State Regulations**

- **Hospital privileges to perform procedure**
  - 12 states

- **Adverse event reporting requirement**
  - 15 states with varying reporting times
  - NC encourages reporting

- **Transfer agreement**
  - 19 states
  - MS, TN and TX if surgeon does not have hospital privileges
Procedure Selection for OBA

Professional Society Recommendations

- American Society of Anesthesiologists
  - "Office-Based Anesthesia: Considerations in Setting Up and Maintaining a Safe Office Anesthesia Environment"

- American College of Surgeons
  - "Guidelines for Optimal Ambulatory Surgical Care and Office-based Surgery"

EXAMPLE: American College of Surgeons

- "Guidelines for Optimal Ambulatory Surgical Care and Office-based Surgery"
  - "...General or spinal anesthesia must be supervised by a board-certified anesthesiologist, a physician eligible to take the anesthesiology board examination or a registered CRNA under physician supervision, as required by current regulations for the jurisdiction in which the facility is located."

Really!

- BC/BE anesthesiologist = CRNA + some physician (if required by jurisdiction)
- Anesthesiologist not BC/BE is less qualified than CRNA + some physician

Individual practitioner determination

- What is the patient’s risk for a particular procedure?
  - Does the procedure have an acceptable risk profile for
    - Hemorrhage
    - Fluid/medication absorption (tumescent liposuction)
    - Hypothermia
    - Infracentury procedures
      - General
      - Thoracic
      - Abdominal
    - OSA
    - DVT/PE
    - PONV
    - Pain control challenges
Procedure Selection for OBA

- What is the patient’s risk for a particular procedure?
  - What are the potential consequences of complications?
  - What is availability of remedial treatment?
    - In office
    - Requires transfer to facility
- Does the procedure require special equipment?
  - Surgical/anesthesia equipment
    - Instruments
    - Imaging/Monitoring
    - Implants
    - Medication

Procedure Selection for OBA

- Professional Liability Insurance Coverage
  - Review policy thoroughly to ensure full compliance with all requirements and that no procedural exclusions exist
  - Review policy of operating surgeon to ensure no limitations or restrictions on type of procedure to be performed
  - Anesthesiologist may unwittingly assume Vicarious Liability for the actions of the surgeon if operating out of the bounds of coverage
Fiscal Suitability for a Proposed Procedure
  - Who is paying for it?
    - CMS?
    - Medical necessity
    - Approved procedure
  - Commercial Insurance
    - Is it covered?
    - Preauthorized?
  - Patient out of pocket
    - Affordable?
    - Highly desirable procedure?

What are we doing now?
  - Dentistry
    - Pediatric and special needs
    - Cosmetic surgery
    - Liposuction
    - Mammoplasty, Augmentation and Reduction
    - Blepharoplasty
    - Rhinoplasty
    - Rhytidectomy
    - Hair transplantation

What are we doing now?
  - Podiatry
    - Bone and joint procedures
    - Soft tissue
  - Ophthalmology
    - Cataract
    - Gastrointestinal Endoscopy
    - EGD
    - Colonoscopy
Procedure Selection for OBA

- What could we be doing?
  - Gynecologic procedures
    - Colposcopy/Hysteroscopy (some already doing endometrial ablation)
    - Cosmetic gynecology
  - Otolaryngology procedures
    - Myringotomy and tympanostomy tubes

- IDEAS?
Nuts and Bolts of Office-Based Anesthesia

Chandra Stephenson, CPC, CPC-H, CPB, CPMA, CCS, CPC-I, CANPC, CEMC, CPIC, CGSC, CIMC, COSC

Agenda

- Basic overview of medical claim form (CMS-1500)
- Tips for submitting a clean claim
- In-network vs. Out-of-network considerations

Completing the Claim Form

- Revised earlier this year
  - www.nucc.org
- Correct completion is the key to a clean claim

CMS-1500 Medical Claim Form

Common Questions when Completing Claim

- What is the appropriate place-of-service for my services?
  - Office: POS 11
  - Mobile: POS 15
- How do I figure units?
  - Depends on the payer/carrier: ASA recommends the “15-minute” unit; however, not all carriers follow this recommendation

Tips for Submitting a Clean Claim

<table>
<thead>
<tr>
<th>Electronic Submissions</th>
<th>Paper Claims</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep all transmission reports</td>
<td>Use only original forms</td>
</tr>
<tr>
<td>Track clearinghouse claims</td>
<td>Avoid folding, if possible</td>
</tr>
<tr>
<td>Ensure software has up-to-date edits</td>
<td>Resist terms such as “refiled claim,” “second request,” or “corrected claims”</td>
</tr>
<tr>
<td>Verify system completes and prints form correctly</td>
<td>Avoid handwritten claims</td>
</tr>
<tr>
<td>Work with software vendor to correct any issues</td>
<td>Use all UPPERCASE letters</td>
</tr>
<tr>
<td>Stay inside the blocks of each line</td>
<td>Ensure claims are printed darkly</td>
</tr>
</tbody>
</table>

www.texmed.org
Tips for Submitting a Clean Claim (cont.)

- Know your contracts and payer policies
  - CPT 00170-00176
  - D9220-D9221
- Utilize your denials to update edits in claim-scrubbing software
- Pre-authorizations

In-Network vs. Out-of-Network Considerations

Out-of-Network

- Did you agree to Accept Assignment?
- Does the patient have out-of-network benefits?
- Do you have a written financial policy you share with your patients to explain their responsibilities (as part of your compliance plan)?
- Ensure this is a uniform policy and meets all compliance rules
- Balance ethics with business considerations
- Don't make deals with third-party negotiation companies
- Patient may need to request claim be re-processed at out-of-network rate
- Be aware some carriers will try to force you to accept assignment – you do NOT have to

Common Questions/Scenarios

- Why isn't their uniformity in coding for the insurance companies?
- How to I avoid claims getting stuck in the “medical vs. dental loop”?
- What/Who can I bill for non-covered services?
- If a procedure is approved “pending review,” can the doctor’s office collect the fee on the day of service?

Recommendations/Reminders

- Financial policies are a must!
- Keep copies
- Work with your patients to help educate them and remind them it is their responsibility for knowing what their policy covers

References

- CMS 1500
  - www.nucc.org
  - www.texmed.org
- CPT® 2014 Professional Edition

- Chandra Stephenson
  - Chandra.stephenson@gmail.com
Designing and Sustaining an OBA Practice

September 13, 2014
Stephen R. Smith MD

Lecture Description:

We will initially discuss the design of an OBA practice beginning with basic market research to define the need the practice seeks to meet and conclude with consideration of continual reassessment and practice improvement. Other considerations we will discuss include the practice’s fiscal viability, regulatory environment, durable equipment and consumables cost as well as labor costs and business overhead.

Practice design must prioritize patient safety above all else, while striving to meet the operating surgeon’s needs. Patient satisfaction must also be a priority as this will be directly communicated with the surgical practice and may determine the decision to utilize services your practice offered.

Beyond the initial practice design, practice maintenance determines the ongoing practice viability and must seek to actively track the degree of success meeting design parameters. Changes in practice must be considered to remediate dissatisfaction with service provided as well as account for changing surgical practice needs and desires as well as shifting patient satisfaction parameters. This requires ongoing surveys of both the surgical staff and patient postoperatively.

Consideration of the regulatory circumstances will require some participation in the legislative process on the local and state level as well as professional licensure boards and their respective oversight committees. Personal involvement with relevant professional societies will be very helpful in this regard.

Finally, a willingness to innovate and objectively assess practice response to change will determine the continuing success or stagnation of the practice. Flexibility in adapting to changing conditions while maintaining the safety and integrity of your practice is the often difficult balance we seek.
Learning Objectives:

1. Describe the factors which determine fiscal viability of an OBA practice.
2. Understand the utility of postoperative patient contact to gauge a practice’s success in meeting design parameters.
3. Articulate examples of adapting an OBA practice’s clinical procedures to the needs of a client practice.

Designing and Sustaining an OBA Practice

September 13, 2014
Stephen R. Smith MD

Market Research
What need do you intend to fulfil?
Example: MO Dental Board and dental sedation mortality spike
Who are your practitioners and who are your patients?
Who will benefit from OBA and why?
Proceduralist
Payer
Patient

Reimbursement
Who is going to pay you and will they pay enough?
Medicare and Medicaid
Medicare
Very low reimbursement compared to commercial rates
Managed Care Medicaid
Managed Care Organization (MCO)
Intermediary insurance company that contracts with an individual state to act as HMO
Paid per capita from state-Finite cash reserve
Generally reimburse for anesthesia services on per case basis
Preauthorization required
Statutory coverage requirements

Straight Medicaid
Depends on individual state rates
Very Bad in Missouri
FQHC and the “wrap around”

Third Party Payers (Commercial Insurance)
Also complicated; carefully research individual policies
Participating (in-network) physician
Paid directly by insurance
Cannot collect advance deposit, but may collect allowable co-pay and/or deductible
Non-Participating (out-of network) physician
Insurance pays patient after service who then pays provider
Delay in payment
Non payment
Physician may collect deposit (100%) up front
May hurt marketability

Decision to participate or not
Does allowable reimbursement meet your minimum charge?
How does participating rate compare with non-participating rate?
Do patients get stuck with extra fee if you don’t participate?
Unhappy patients make unhappy surgeons
Can you “balance bill” the patient? Illegal in some states

You save them money (no facility fee) so why don’t they want to reimburse a procedure done with OBA that they would approve for the hospital?
Out of pocket; personal payment by patient
  Cash payment prior to service
  Credit Card
  Negotiated payment plan with provider
  Care Credit

Regulation: Who says what you can and cannot do/What can you do?

Federal Regulation
  Medicare Participation standards
  Occupational Health and Safety Administration (OSHA)
    [www.osha.gov](http://www.osha.gov)
  Clinical Laboratory Improvement Amendments (CLIA)
    [www.hcfa.gov](http://www.hcfa.gov)
  Americans with Disabilities Accessibility Guidelines (ADAG)
    Individual state Departments of Health

State Regulation
  Statutory; only 23 states regulate
  Licensing Boards
    Medical Board
    Other Practitioner Boards; Dental Board
  Professional Society Standards and Guidelines
    ASA OBA guidelines
    American College of Surgeons
    American Society of Plastic Surgeons/AAAASF
    American Academy of Pediatric Dentistry
  Accreditation Certifying Bodies
    AAAHC
    AAASF
    JCAHO

Professional Liability Insurance

Practice Design
  Fixed Office
    Basically addressed by the above discussion
  Mobile anesthesia
In addition to the above:

Mobile anesthesia equipment
Gas Machine
  Durable for transport and daily setup/take down
Maintenance schedule
  Regular calibration
Monitors
  Durable for transport
  Size convenience/Display visibility
Battery backup
Standard vital sign parameters
  EKG, SpO2/pulse, NIBP and Temp
  Capnometry/Capnography
  Waveform analysis vitally important
  Lejay Levene

Instrument processing and Infection Control
Airway equipment
Other patient contact equipment
Medication
Consumables
Medical gases
  Fresh gas
  Waste gas

Accreditation

Practice Maintenance and IMPROVEMENT (closing the loop)
Quality Improvement/Patient Safety
  QI Committee
Proceduralist relations, “How’m I doin”?"
  Surgeon/Dentist
    Examples from Pediatric Dental practice
    Nasal intubation
  Office manager
    Patient questions
    Cash flow
    Insurance participation
Patient satisfaction
  Follow up telephone survey
  Examples from Pediatric Dental practice
    Identify with your patient/parent “Don’t be an *ss”
Explain the procedure/allay fear and anxiety
Parental presence for induction of general anesthesia
Personal Satisfaction, What can I do better?
Clinical care
  N&V
  Sore throat
  Emergence delirium

Questions for Commercial Insurers about OBA Reimbursement

1) ?
2)
3) You save them money (no facility fee) so why don’t they want to reimburse a procedure done with OBA that they would approve for the hospital?
Risk Management and Legal Pitfalls of an OBA practice

A presentation to ASDA and SAMBA

September 13, 2014
Wendy Longmire
Senior Clinical Risk Management Consultant

Risk Management Issues for the Dental Anesthesiologist

Course Objectives
At the conclusion of this presentation, the participant will be able to:
• Explain the evolution of the risk associated with insuring anesthesia practice
• Describe risk management issues common to the delivery of services in the mobile dental anesthesia setting
• Identify the risk issues presented by anesthesia case studies

Risk Management Issues for the Dental Anesthesiologist

The Evolution of Anesthesiology Risk

2010s

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<tr>
<th>Lowest Risk</th>
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<td>Vascular Surgery</td>
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Why the improvement?
• Better drugs
• Better equipment
• An orientation to proactive risk management
• Regular simulations/drills

Risk Management Issues for the Dental Anesthesiologist

Challenges for the MDA
• Adverse patient selection
• Pre-anesthesia interview/evaluation/clearance
• Achievement of adequate informed consent to anesthesia
• Lack of familiar “team”
• Maintenance of meds and equipment
• Post-anesthesia monitoring/evaluation
• Emergencies
• Record keeping

Some suggestions
• Evaluate the practice, focusing on the above risks
• Work with the same staff members in each office
• Regularly conduct simulations/drills at practice locations

Risk Management Issues for the Dental Anesthesiologist
Risk Management Issues for the Dental Anesthesiologist

Case One

This patient suffered an extreme phobia of dental care; as a result, she generally avoided it. In time, she was diagnosed with generalized periodontitis due to her failure to undergo preventative care.

The patient’s general dentist referred her to a local periodontist for an evaluation, and he presented a number of treatment options. When faced with the potential loss of her dentition, the patient reluctantly agreed to a conservative treatment plan consisting of root planing, chemotherapy, and aggressive maintenance.

Because of her phobia, she requested that the periodontist pre-medicate her with a sedative, and he agreed. She was given 10 mg of diazepam to take at bedtime before her 9 a.m. appointment the following day. She followed the doctor’s instructions, taking the diazepam at bedtime and retiring to sleep.

Risk Management Issues for the Dental Anesthesiologist

The periodontist, while busy with another patient, was informed of the patient’s request. He agreed that nitrous oxide would be appropriate. With the doctor’s approval, the assistant began the inhalation therapy, and the doctor appeared soon after to administer the local anesthetic.

Upon observing the injection needle, the patient asked the doctor to increase her nitrous oxide level, which he did.

After the appropriate amount of time, the procedure was commenced. However, the patient was still anxious, so the doctor increased her nitrous oxide level once again. About 5 minutes into the procedure, the patient vomited, aspirated some of her vomitus, and lost consciousness.

EMS was called, and, while awaiting their arrival, the doctor tried to establish an airway but was unsuccessful. Despite attempted resuscitation at the scene and the hospital, the patient expired.

Risk Management Issues for the Dental Anesthesiologist

The anesthesiologist instructed the Phase 1 nurse to not administer Lortab (it is normally a standing order). After the ENT surgeon and the anesthesiologist consulted, it was agreed that the family would be instructed not to fill the Lortab prescription they had been given, but to use Tylenol instead. When the patient was transferred to Phase 2 of the PACU, the following entry was made in the record: “PO pain med held due to patient’s sleepiness. Will continue to monitor in Phase 2…. Phase 2 nurse aware of pain med not given. Report given.”

In Phase 2, the patient appeared to be doing well although he seemed to be in pain and the family requested pain medication. After consulting with another nurse, the Phase 2 nurse administered 3 ml of Lortab. It should be noted that when the anesthesiologist instructed the Phase 1 nurse to not administer the Lortab, he did not cross out the standing order in the chart; he simply gave a verbal order. For that reason, the standing order for 5 to 7 ml of Lortab was still present in the chart. The Phase 2 nurse understood that the Lortab had simply been withheld earlier because of the patient’s sleepiness.

Risk Management Issues for the Dental Anesthesiologist

The following morning, the patient ate breakfast, was picked up by a friend, and was driven to the periodontist’s office. In route to the office, she was still feeling significant anxiety, so she tried to relax by inhaling a moderate amount of cannabis.

The patient arrived at the office, checked in with the front office staff, and was seated in an operatory shortly thereafter. Once in the operatory, the reality of the moment became evident, and she began to feel severely apprehensive.

The dentist assistant noticed her anxiety and offered her the option of having the procedure done using nitrous oxide analgesia, to which the patient agreed. Unfortunately, the practice had no nitrous oxide protocol in place. Thus, few questions were asked about the patient’s recent ingestion of medication or food and drink.

Risk Management Issues for the Dental Anesthesiologist

The patient was a four-year-old male who presented to an outpatient Surgery Center for a tonsillectomy and adenoidectomy. He had a history of OSA, enlarged tonsils, and was mildly obese, however, he was otherwise healthy.

The duration of the surgery was eight minutes, and it was unremarkable. Following the surgery, the patient was transferred to the Phase 1 PACU in stable condition. He was still intubated at that time. After a period in the Phase 1 unit, the patient attempted to self-extubate, and the nurse extubated him.

Shortly after the patient was extubated, he suffered a brief period of oxygen desaturation. CPAP was administered but the saturation level remained low. The anesthesiologist was summoned, and he performed a “jaw thrust” maneuver, which caused respirations to return to normal. The patient suffered a second episode of desaturation shortly thereafter, however, this was corrected by increasing the oxygen level and changing the patient’s position.

Risk Management Issues for the Dental Anesthesiologist

After about an hour in Phase 2, the patient was evaluated as stable for discharge, although he was still deeply somnolent. This was not considered uncommon since he had been up much earlier than usual to come in for the surgery. There are disputed facts regarding whether, prior to discharge, the Phase 2 nurse advised the anesthesiologist that she had administered the Lortab (although it is documented in the chart).

It is agreed that, if he was not already aware of it, upon review of the medical record, the anesthesiologist became aware of the administration of the Lortab. While the anesthesiologist had advised the family to not fill the Lortab prescription, at no time did he inform them that the child had received Lortab in Phase 2.

Risk Management Issues for the Dental Anesthesiologist

Case Two

This was not considered uncommon since he had been up much earlier than usual to come in for the surgery. There are disputed facts regarding whether, prior to discharge, the Phase 2 nurse advised the anesthesiologist that she had administered the Lortab (although it is documented in the chart).

It is agreed that, if he was not already aware of it, upon review of the medical record, the anesthesiologist became aware of the administration of the Lortab. While the anesthesiologist had advised the family to not fill the Lortab prescription, at no time did he inform them that the child had received Lortab in Phase 2.
The patient was put into his car seat and slept soundly all the way home. When they arrived home, they put him on a couch in the living room. Unfortunately, the other family members present also fell asleep in the living room and no one remained awake to monitor the patient. Some time passed before anyone realized that he was not breathing. EMS was summoned and resuscitation was attempted at the scene, followed by transportation of the patient to the hospital. Later in the day, he was declared brain dead and life support was discontinued.

Case Three
The patient was a 53 year old female who was referred to an oral surgeon for extractions. She had a previous history of extreme sensitivity to local anesthetic, and had experienced several anaphylactic reactions to it in the past.

The patient arrived as scheduled and was asked to complete a health history form, which was then reviewed by Dr. S prior to commencement of treatment. The patient failed to indicate on the form (or otherwise) that she had this sensitivity to local anesthetic. The patient was appropriately draped and the procedure was commenced. Within a short time (~ 30 seconds) after administration of the local anesthetic, the patient lost consciousness and went into respiratory arrest. This quickly progressed into cardiac arrest.

The patient’s condition was assessed and, because the practice was well trained and rehearsed in dental emergencies, and aggressive resuscitation was commenced immediately. EMS was summoned and the resuscitation was continued enroute to the hospital with, Dr. S accompanying her in the ambulance. Despite continued aggressive treatment at the hospital, the patient expired.

The information contained herein and presented by the speaker is based on sources believed to be accurate at the time they were referenced. The speaker has made a reasonable effort to ensure the accuracy of the information presented; however no warranty or representation is made as to such accuracy. The speaker is not engaged in rendering legal or other professional services. If legal advice or other expert legal assistance is required, the services of an attorney or other competent legal professional should be sought.
Session Objectives:

2. Discuss Incidence of Airway and Surgical Fires
3. Discuss Management of Airway Fires
4. Prevention of Airway Fires

Stem Case:

3.5 year old girl, 16 kg, ASA I, NPO > 8 hours, presents in pediatric dental office for 8 fillings, crowns, root canal treatments. Malampatti I airway with no tonsillar hypertrophy or history of snoring. NKDA. No anesthesia machine but dental nitrous oxide/oxygen machine available.

Intramuscular ketamine 3 mg/kg administered for IV start. Standard ASA monitors with nasal cannula capnography, pre-tracheal stethoscope and supplemental oxygen at 3 l/m placed with nasopharyngeal airway. 22G IV catheter secured and propofol/remifentanil 5 mcg/ml mixture titrated to effect (~100 mcg/kg/min). X-rays taken. Moistened throat pack/screen placed. Within a couple minutes of drilling, flash airway fire occurs. Dentist and assistant see spark flying from tooth and landing on throat pack.

Management: Dentist anesthesiologist immediately turns off oxygen, dentist pulls out throat pack. DA assesses airway to find injured tissue in oropharynx. Direct visual laryngoscopy finds hypopharyngeal scarring/edema without vocal cord involvement. Rocuronium administered and patient intubated. Within 5 minutes soft tissues closed around endotracheal tube. Patient is transported via helicopter to local pediatric burn center.

Key Questions:

1. Was this a foreseeable event?
2. Was the management correct?
3. Could this complication have been prevented?
4. Could you have managed this complication without assistance?
5. Are you prepared to follow the ASA Practice Advisory on Surgical Fires?
References: (focus on office-based facial/oral surgery)


The patient is on fire!: a surgical fires primer [guidance article]. Health Devices 1992 Jan;21(1):19-34.


**PBLD: Ambulatory Anesthesia for Patient with confirmed History of MH and allergy to Soy and egg phospholipids**

Zakaria Messieha, MD  
Clinical Professor of Anesthesiology  
University of Illinois at Chicago Colleges of Dentistry and Medicine

**Objectives:**

1) Understand trigger agents for malignant hyperthermia and their contraindication for such cases.  
2) Understand what the literature says about allergy to soy and egg phospholipids as it pertains to propofol use.  
3) Understand the alternatives available to patients with such history for safe ambulatory anesthesia

**Stem Case**

23 year old male with PMH significant for severe autism, non-verbal and uncooperative behavior. He is on no medications. His mother reports confirmed allergies to soy and egg phospholipids. His anesthesia history is remarkable for confirmed malignant hyperthermia at age 6 when he needed tonsillectomy. Treatment was successful with one night in-hospital stay for observation and no residual organ damage. He is 5 foot 9 inches tall and 180 lbs. He is scheduled for an oral surgery procedure estimated to take 2 hours under intubated general anesthesia. Patient lives at home with both parents who are in their mid 50’s and healthy. Plan is to conduct the procedure in the oral surgeon’s office with an anesthesia team managing the anesthesia care.

**Challenges:**

This patient has confirmed MH and allergy to soy and egg phospholipids. He also has behavioral management challenges regarding his autism and lack of verbal communication. With the limited options for anesthesia management, what is the best approach for managing this individual safely while maintaining the ability to discharge him safely to his parents care.

**Questions:**

1) What are the agents contraindicated for an individual with confirmed MH?  
2) What does the literature say about allergy to soy and egg phospholipids in relationship to use of propofol?  
3) What are the anesthesia alternatives for safe management of this patient?  
4) With limited anesthesia options would the available protocols prolong recovery time? Is ambulatory surgery possible with such options.

**Discussion Points:**

A) All inhalation agents as well as succinylcholine are trigger agents for MH and are an absolute contraindication for confirmed cases. Is there a volatile agent-naïve anesthesia machine in your facility?  
B) With the behavioral challenges starting and IV for intravenous induction may not be an option. Consider IM ketamine for induction.
C) What does the literature say about soy and egg phospholipid allergies with regard to the use of propofol?

References:


PBLD: Nasal Intubation after Cleft Palate Repair

Stephen R. Smith MD

Learning Objectives:

1. What are the advantages of nasal vs oral route of endotracheal intubation for pediatric dentistry?

2. How are cleft palates classified?

3. What anatomic factors post-repair complicate subsequent nasotracheal intubation?

Cleft lips and palates occur in about 1 or 800 births in the US and about 1 in 500-600 births worldwide. Cleft lips and cleft palates may occur individually or in conjunction and may be unilateral or bilateral. Cleft lips are classified as complete or incomplete and whether they are unilateral or bilateral. Cleft palates are classified as affecting the primary palate or secondary palate or both; the incisive foramen located immediately posterior to the central incisors is the anatomic divider for the primary and secondary palates. The primary and secondary clefts may be further classified as complete or incomplete as well as bilateral or unilateral.

Cleft palate repair is usually performed between six to eighteen months of age and 6-12 weeks for simple cleft lip repair. The repair is typically performed in stages, but it is important to complete the repair prior to three years of age to avoid impaired language development. Frequently, the inability to seal the soft palate against the pharynx (velopharyngeal incompetence) resulting in characteristic hypernasality of speech requires surgical intervention. Flap pharyngoplasty is typically performed to allow the child to isolate the nasopharynx from the oropharynx, facilitating normal speech.

Describing the different surgical techniques of pharyngeal flap surgery is beyond the scope of this discussion, but the end result is the same; velopharyngeal sealing. In some instances, the sealing may be so complete as to result in airway obstruction and sleep apnea, especially with postoperative scar contraction, and this possibility should be considered when inducing anesthesia in these patients.

These patients frequently require further dental and oromaxillofacial corrective procedures and those surgeons typically desire nasotracheal intubation to allow unfettered access to the oral cavity. Unguided NTI is generally considered unacceptable in the presence of a pharyngeal flap, but several authors have described techniques using intubation guides to facilitate NTI. That is the focus of our discussion today.


Kopp, Vincent J.; Rosenfeld, Michael J.; Turvey, Timothy A. Anesthesiology. 82(4):1063-1064, April 1995.


A Novel Approach to Nasotracheal Intubation in Pediatric Patients with Prior Palate or Pharyngeal surgery.
PBPD: Hypotension while on Phentermine

Arnaldo Valedon, MD, Managing Partner and Chief ASC Division,
First Colonies Anesthesia Associates, Frederick, MD
SAMBA Board Member

Title: Severe Hypotension during Partial Breast Reconstruction

Session Objectives:

1. Understand potential perioperative complications of phentramine and phentermine therapy.
2. Discuss difference between phentermine and phentramine as well as mechanisms of action for anorexiant therapy.
3. Discuss side effects of phentermine.
4. Discuss treatment options for phentermine-induced hypotension.

Stem Case:

64y/o female presenting to office based plastics surgery center for nipple reconstruction after previous breast reduction. Patient has a history of depression, mild osteoarthritis, and stated well-controlled hypertension. Pre-op medications (all on stable regimen for over 1 year): Wellbutryn XL 300mg qD, Metropolol ER 50mg po QD, Celebrex 200mg po QD, Phentermine HCL 37.5mg po QD. She has NKDA. Previous surgeries included: breast reduction, tubal ligation, carpal tunnel release, and liposuction of abdomen. She had no active cardiovascular symptoms, did not exercise often, and smoked 1/2 PPD.

Upon arrival day of surgery: BP 160/90, HR 69, RR 16, POX 98%. Height 58in, Weight 147 (BMI 29.9). Patient was moderately anxious, Class 2 airway, and a otherwise normal physical exam. Patient strongly preferred general anesthesia for the procedure. Induction consisted of Propofol 150mg. Patient was easily assisted with ventilation followed by easy placement of LMA. Patient was given Decadron 4mg and Zofran 4mg IV for PONV prophylaxis. BP was approximately 95/50 and HR 55 after induction with patient supine.

Intraoperative course was significant for an undetectable blood pressure by automatic cuff x3 immediately after beach chair position was assumed at surgeon’s request. Heart rate was high 30’s to 40’s. Patient was given a total of 50mg of IV Ephedrine in divided doses over 5-10 minutes and placed supine again. First detectable BP (supine) was 60 mmHg after ephedrine given. Patient was then given Atropine 0.5 mg IV, with heart rate increasing to mid 50’s. Patient was then given IV Epinephrine 0.2 mg, with blood pressure readings in the 200/120-130 range and heart rate in the 100-120 range. After blood pressure normalized, patient was then slowly placed in beach chair position again. Several episodes of severe hypotension and hypertension ensued over 15 minutes. Hypotension was treated with doses of Epinephrine and Phenylephrine. After approximately 20 minutes ST depression was noted. Surgeon was asked to abort the procedure. Patient was placed in the supine position, and LMA removed after patient followed commands.

Upon arrival to PACU, patient was neurologically intact, pain-free, and without any cardiovascular complaints. Blood pressure and heart rate were in normal range. Patient was transferred to the hospital for further management.

After arrival in the ER and after initial work up, patient signed herself out AMA (and reluctantly
agreed by husband). Patient was recommended to have full cardiac workup to include stress testing, which she has not done to date. Cardiac enzymes were negative.

Key Questions:

1. How should this patient be appropriately prepared preoperatively?
2. Was the Intraoperative management of this patient intraoperative complication ideal?
3. Should phenylephrine or epinephrine be the first line of therapy for phentermine-induced hypotension?
4. What is the mechanism of action of vasopressin?

Discussion on pre-operative assessment:

1. Clinical history and symptomatology
2. Medication management

Discussion on Management of Intraoperative Complications:

1. Intraoperative positioning
2. Spontaneous breathing vs positive-pressure ventilation
3. Hypotension
4. Bradycardia
5. Cardiac ischemia
6. Ephedrine vs Epinephrine vs Phenylephrine vs Vasopressin

Bibliography:


Phentermine
Phenyl-Tertiary-Butylamine

Commercial Trade names
- Adipex P
- Adiphene
- Anoxine-AM
- Duromine
- Metermine
- Mirapont
- Obephen
- Obeplene
- Obestin-30
- Obenix
- Phermine
- Redusa
- Pro-fast SA
- Trenker
- Panbesy
- Sinpet
- Supremin
- Teramin
- Umire
- Weltmine
- Zantryl
- Phenterex
- Phentermine

Phentermine vs Phentramine
- Phentermine
  - Phentermine hydrochloride USP is a manufactured sympathomimetic appetite suppressant of the amphetamine and phenethylamine class. It is available in oral, intravenous and insufflation routes, and is a Schedule IV controlled substance in the US. It is prescribed for short term use (<12 wks) to assist weight loss in obese patients (BMI >30).
Phentermine vs Phentramine

Phentramine
- Phentramine consists of 20:1 Hoodia extract, Guarana

Phentermine
- History
  - First approved by FDA in 1959 as an anorexiant
  - Few large clinical studies performed. Early 1990 studies led to use of combination of phentermine with fenfluramine or dexfenfluramine (Fen-Phen)
  - Fen-Phen manufacturers voluntarily removed the drug from the market in 1997 after echocardiographic evidence of heart valve disease in over 30% of treated patients. Patients were asymptomatic.
  - Phentermine, as a single drug, was not withdrawn from the market and is still prescribed today.
  - FDA approved use of Phentermine/Topiramate (Qsymia, formerly Qnexa) combination for weight loss in July 2012. Side effects include dry mouth, constipation, finger tingling, and potential birth defects.

Phentermine
- Mechanism of action
  - Central hypothalamic release of norepineprine, leading to appetite suppression on clinical doses. Higher (non-clinical) doses can lead to serotonin and dopamine release.
  - Peripheral release of epinephrine, causing fat breakdown.

SIDE EFFECTS

- Insomnia
- Hypertension
- Arrhythmia
- Irritability
- Diarrhea
- Euphoria
- Psychosis
- Confusion
- Irregular BP

- Cardiac ischemic events
- Palpitation
- Tachycardia
- Dizziness
- Fever Tremors
- Panic attacks
- Dry mouth
- Acid reflux
- Nausea/Vomiting

PBLD: Severe Hypotension during Partial Breast Reconstruction

PBLD: Severe Hypotension during Partial Breast Reconstruction

PBLD: Severe Hypotension during Partial Breast Reconstruction
Treatment of Phentermine-induced Hypotension:
• Ephedrine?: Sympathomimetic amine acting mainly indirect stimulation of the adrenergic receptor system via increased activity of norepinephrine at post-synaptic α- and β-receptors. Effects unpredictable due to phentermine-induced imbalance of norepinephrine.
• Epineprine?: Nonselective agonist of all adrenergic receptors, including the major subtypes alpha 1,2,3 and beta 1,2,3. Causes systemic vasoconstriction, gastrointestinal relaxation, tachycardia, bronchial and cerebral vasodilation.

Treatment of Phentermine-induced Hypotension:
• Vasopressin: Synthetic analogues of arginine vasopressin (AVP) used for fluid homeostasis and vasoconstriction. Vasoconstriction due to V1 receptor activity.

Summary

- Short and long-term use of phentermine can lead to significant hemodynamic and cardiovascular changes due to central imbalance of norepinephrine and, potentially, dopamine and serotonin.
- Consider vasopressin for treatment of phentermine-induced hypotension.
- Consider discontinuing phentermine at a minimum 4 days prior to surgery and, ideally a week or longer.
OBJECTIVES
1. Understand guidelines for pediatric outpatients undergoing anesthesia, including recommendations for age, training, and equipment.
2. How to prepare for the unique anesthesia requirements for the extremes of age in an office based practice.
3. Review of the perioperative complications because of age-related concomitant diseases and a generalized decline in organ function,

You are asked to provide anesthesia for an infant requiring bilateral inguinal hernia repair. The hernia incarcerated three days previously and was difficult to reduce at that time. The baby was born at 32 weeks of gestational age and is now 28 weeks old, or 60 weeks post-conceptual age (PCA). Weight is 4800 g. Oxygen was required for the first two days of life but not since that time. There have been no documented apneic spells and the baby has been at home for the past 24 weeks. A recent blood count showed a hemoglobin of 32. The baby has been well and is on no medications apart from vitamins and iron. The surgeon would like to perform surgery on an outpatient basis.
Questions:
1. What should be in place at the center before proceeding?
2. What factors predict the occurrence of postoperative apnea?
3. Is regional anesthesia the technique of choice?

Your next patient is an otherwise healthy ten-year-old scheduled for tonsillectomy. There is no asthma or evidence of sleep apnea but the child snores. He has never had an anesthetic and there is no family history of anesthesia problems. The child had a URI with fever and systemic symptoms approximately two weeks ago. He had copious but clear nasal discharge. He no longer has a fever, his appetite has returned, and his rhinorrhea has resolved. He has a non-productive cough but his lungs are clear to auscultation.
Questions:
1. Does this patient require special equipment or trained personnel?
2. Is the child with URI at an increased risk of perioperative complications?
3. How can you identify which patients with a URI are at risk?
4. Is there ways to avoid respiratory complications?

Following the two pediatric cases, your next case is an 82 year old male scheduled for a removal of a nasal polyp under general anesthesia. He is has a history of hypertension controlled on Toprol XL. He is on no other medications and has no known allergies. His BMI is 28. He lives alone and is relatively functional. However, his daughter said that his memory has deteriorated over the last few months.
Questions:
1. What are the unique considerations for the anesthesia care of this patient?
2. Is the anesthesia requested the best choice? How could he be best managed?
3. What are the post-operative concerns?

Allen GS, Cox CS Jr, White N, Khalil S, Rabb M, Lally KP. Postoperative respiratory complications in ex-pre-

Bettelli, G. High risk patients in day surgery. MINERVA ANESTESIOLOG 2009;75:259-68


