




**PROGRESSIVE
SURGICAL**
Half Time

Keeping you "in the know" in the ASC industry

The Extremes:

The very young.....
& the very old.....
presenting for ambulatory
surgery.

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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?
- FDA Warning

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"

<http://allnurses.com/general-nursing-discussion/pals-go-age-498441.html>




Pediatric Definitions

- Council on Child and Adolescent Health, 1988 defined the age limits of pediatrics to be from fetal life until age 21 years.
- **Pediatrics** is the specialty of medical science concerned with the physical, mental and social health of children from birth to young adulthood (AAP) (<http://www.aap.org/>)
- **Pediatrics** is the branch of medicine that deals with the medical care of infants, children, and adolescents, and the age limit usually ranges from birth up to 18 (in some places until completion of secondary education, and until age 21 in the United States). (<http://en.wikipedia.org/wiki/Pediatrics>)
- **BLS/PALS:** The term "infant" includes the neonatal period and extends to the age of 1 year (12 months). For the purposes of these guidelines, the term "child" refers to the age group from 1 year to 8 years. (http://cinc.ahsjournals.org/content/102/suppl_1/1-293.full)
- Age Definitions - infant = under one year of age
 - Child = children approximately 1 year to puberty
 - Defined as breast development in girl
 - Presence of armpit hair in the boy
 - Adult = applies to all beyond puberty (http://c.vmcfdn.com/sites/levy.masscrna.com/resource/resmgr/pals_2010_overview.pdf)
- Pediatric BLS and ALS interventions tend to blur at the margins of age because there is no single anatomic, physiological, or management characteristic that is consistently different in the infant versus the child versus the adult victim of cardiac arrest. Furthermore, new technologies such as AEDs and the availability of airway and vascular access adjuncts that can be implemented with a minimum of advanced training create the need to reexamine previous recommendations for therapies based on age. (http://cinc.ahsjournals.org/content/102/suppl_1/1-293.full)




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
- Above from <http://www.audio-digest.org/pages/htmls/summary.html?sub1=AN5544>




How young is too young for ambulatory 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**



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 moist productive cough, nasal congestion, induction with thiopental (vs 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; c
 - Conclusion
 - Increased risk for children with URI by history, snoring, passive smoke exposure, nasal congestion, or productive cough;
 - Intubation increases risk (decreased with laryngeal mask airway [LMA] or face mask)
 - Propofol presents lowest risk for intravenous (IV) induction
 - Reverse muscle relaxation and 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 (eg, 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 morbidity associated with elective procedures with careful management of anesthesia
 - For child with viral myocarditis, delay of procedure for active URI does not alter risk for fatal arrhythmias (focus on airway management)




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



You better have.....

- ✓ ASA Statement on Practice Recommendations for Pediatric Anesthesia
- ✓ Society for Pediatric Anesthesia
<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>



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 cricthyrotomy 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



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.....



FDA Drug Safety Communication: FDA review results in new warnings about using general anesthetics and sedation drugs in young children and pregnant women

- Repeated or lengthy use of general anesthetic and sedation drugs during surgeries or procedures in children younger than 3 years or in pregnant women during their third trimester may affect the development of children's brains.
- Relatively short exposure to general anesthetic and sedation drugs in infants or toddlers is unlikely to have negative effects on behavior or learning.
- **Health care professionals** should balance the benefits of appropriate anesthesia in young children and pregnant women against the potential risks, especially for procedures that may last longer than 3 hours or if multiple procedures are required in children under 3 years

<https://www.fda.gov/Drugs/DrugSafety/ucm532356.htm>



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*





Table 1. Top 10 Ambulatory Surgery Procedures in Patients Older than 65 Years


	Number of surgical procedures in thousands (Medicare's percentage)
Inguinal and femoral hernia repair	38 (23)
Therapeutic procedures on muscles and tendons	44 (19)
Therapeutic procedures on joints	19 (13)
Cholecystectomy and common duct exploration	21 (16)
Excision of semilunar cartilage of knee	23 (15)
Lumpectomy, quadrantectomy of breast	33 (23)
Lens and cataract procedures	342 (75)
Decompression of the peripheral nerve (e.g., carpal tunnel release)	27 (24)
Partial excision of the bone (e.g., bunionectomy)	15 (17)
Transurethral excision, drainage, or removal of a urinary obstruction	33 (40)

From U.S. Department of Health & Human Services, Agency for Healthcare Research & Quality (2003).

"...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:....."


- 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

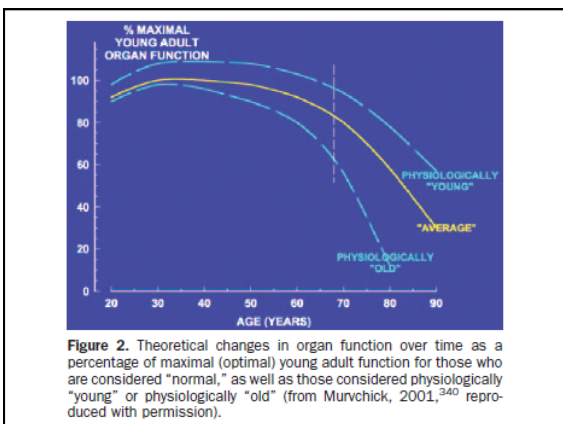
Mathis et. al., Anesthesiology 2013; 119:1310-21



The Elderly (from White et al Anes Analg June 2012 Vol 114, No 6 p 1190)

- 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”





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/Live

- 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





Obstructive Sleep Apnea



34


OSA Case Report

- Five lap-band deaths at ambulatory surgery centers in Los Angeles area in two years
 - LA Times December 2011
- Coroner's autopsy report 2010-08560:
 - The expected standard of anesthesia care was not met
 - Suboptimal care of sleep apnea and negative pressure pulmonary edema
 - Preop evaluation made no mention of the patient's known OSA
 - Patient extubated while still partially paralyzed by relaxant
 - Emergency care and transfer process deemed inadequate



Epidemiology of OSA

- 5% of general population
 - *Am J Resp Crit Care Med* 2002;165:1217
- 22% in general surgery population
 - *Sleep Med* 2009;10(7):753
- 40% if have HTN or DM or CHF
- 70% of bariatric surgery patients
 - *Am Surg.* 2008;74(9):834
- 80-90% have ***not*** been diagnosed



OSA: Symptoms

- Snoring
- Excessive daytime sleepiness (EDS)
- Observed apneas
- Morning headache
- Awakening with choking or gagging sensation



OSA: Associations

- HTN
- Obesity
- Pulmonary HTN
- Hypoxia
- Hypoventilation syndrome
- Poor memory and mood
- Nocturnal enuresis
- Impotence
- Decreased wound healing
- Delirium



Diagnosis

- AHI (**apnea-hypopnea index**) is number of events per hour of sleep
- Severity of OSA determined by AHI
- Mild: AHI 5-15
- Moderate: AHI 15-30
- Severe: AHI > 30
- Consider also severity of symptoms and desaturations



Treatment

- Conservative measures (wt loss, ETOH avoidance, avoid supine position, tennis ball)
- CPAP (continuous positive airway pressure)
- biPAP (bilevel positive airway pressure)
- Oral appliance
- Surgery (UPPP)
- Tracheostomy



Why increased risk in peri-procedural period?

- Sedatives/anesthetics/opioids
 - Increase pharyngeal relaxation and thus increase apnea frequency and duration
 - Blunt the hypoxic and hypercapnic ventilatory responses
 - Blunt CNS arousal response
- Supine or other unique body positions
- Chronic untreated apnea leads to.....
 - Hypertension and pulmonary hypertension
 - Polycythemia
 - Pickwickian hypersensitivity to analgesics and hypoxia-driven respirations.
- And 80-90% of patients are undiagnosed



ASA Guidelines

"Practice Guidelines for the Perioperative Management of Patients with Obstructive Sleep Apnea"

- Approved by the ASA House of Delegates on October 25, 2005
- Anesthesiology 2006; 104:1081-93

"Practice Guidelines for the Perioperative Management of Patients with Obstructive Sleep Apnea. An Updated Report by the American Society of Anesthesiologists Task Force on Perioperative Management of Patients with Obstructive Sleep Apnea"


- updated evaluation of scientific literature and findings from surveys of experts and randomly selected ASA members. The new findings did not necessitate a change in recommendations.
- Critical analysis of data from a large-scale survey of practicing anesthesiologists rather than a consensus opinion of a few individuals.
- apply to both inpatients and outpatients.
- apply to both pediatric and adult patients.
- Anesthesiology 2014; 120:90-100

<https://www.asahq.org/For-Members/Practice-Management/Practice-Parameters.aspx>




ASA Guidelines: 2006 vs 2014

2006	2014
<ul style="list-style-type: none"> • Scoring System <ul style="list-style-type: none"> - Step 1- Score Severity (study or history) - Step 2- Score Invasiveness and Narcotic Requirement - Step 3- Subtract 1 if compliant with CPAP - Step 4- Add Steps 1, 2 and 3 - OSA with score 4 or less & can be safely done as an outpatient • Upper Abdominal and Airway Surgery not suitable for ambulatory setting <ul style="list-style-type: none"> - Upon discharge: room air sat stable, patient not hypoxicemic or obstructing with left undisturbed, consider keeping some OSA for 3 hours longer than the norm or 7 hours after last obstructive or hypoxicemic episode. 	<ul style="list-style-type: none"> • Develop Screen for OSA • Consider severity, invasiveness and post-op narcotic requirements • Outpatients: consider co-existing conditions <ul style="list-style-type: none"> - Patients at increased perioperative risk from OSA should not be discharged from the recovery area to an unmonitored setting (i.e., home or unmonitored hospital bed) until they are no longer at risk of postoperative respiratory depression. • Involve family and surgeon




ASA 2014: Suggested Preoperative Evaluation

- Outpatient vs. Inpatient: Literature insufficient to offer guidance
- ASA expert and membership recommend before proceeding with outpatient care, consider:
 - **Severity** of OSA
 - Anatomical/physiologic abnormalities
 - Co-existing diseases
 - Nature of surgery
 - **Type of anesthesia**
 - Need for postoperative opioids
 - Patient **age**
 - Adequacy of **post discharge** observation
 - **Capabilities** of outpatient facility



ASA 2014: Suggested Preoperative Preparation

- CPAP – study supports use of CPAP lowers frequencies of serious post-op complications when pre-operative at-home use vs no CPAP
- Mandibular Advancement or Oral Appliances – literature insufficient
- Preoperative weight loss - literature insufficient
- ASA expert and membership recommend:
 - **Preoperative initiation of CPAP should be considered** (especially if severe OSA)
 - Consider preoperative: Mandibular Advancement or Oral Appliances & Preoperative weight loss



ASA 2014: Suggested Intraoperative Management

- Literature insufficient to offer guidance
- ASA expert and membership recommend:
 - Superficial procedures: consider **local or peripheral nerve block**
 - Peripheral procedures consider **spinal/epidural**
 - If MAC used, use CO2 monitor & consider using CPAP.
 - GA with **secure ETT better than big MAC**
 - Extubate awake & in non-supine position
 - Use full reversal



ASA 2014: Suggested Postoperative Management

- Literature insufficient to offer guidance
- ASA expert and membership recommend:
 - **Minimize Narcotics**: consider local or peripheral nerve block & NSAIDS
 - Use supplemental O₂ until able to maintain baseline SAT on room air
 - CPAP w/ or w/o O₂ when feasible (when not ambulating or not contraindicated by procedure).
 - Keep in **non-supine** position



SAMBA Consensus Statement


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

• Published in 2012 to counter the 2006 ASA guidelines
• Anesthesia & Analgesia 2012; 115:1060-1068




2012 SAMBA Consensus Statement vs. ASA 2006 Guidelines

ASA 2006	SAMBA 2012
<ul style="list-style-type: none"> • Outdated • 12 item screening tool • Scoring System – not validated and based on severity of OSA, invasiveness of surgery, anesthetic technique • Upper abdominal & airway procedures not suitable 	<ul style="list-style-type: none"> • STOP-BANG: <ul style="list-style-type: none"> – high sensitivity. – higher # of positive indicators greater chance of severe OSA • Laparoscopic Upper Abdominal procedures can be done (must follow perioperative precautions) • No guidance either way on upper airway surgery (limited evidence) • Post-Op: CPAP compliance, minimize narcotics, involve family, provide specific instructions.



SAMBA & ASA Consensus

- May proceed with patient who have presumptive OSA via screening, except:
 - Patients with non-optimized medical conditions.
 - Painful ambulatory surgery requiring opioids.
- CPAP (mixed message)
 - No clear evidence that sleep study & preop CPAP improve outcome
 - Known OSA should bring CPAP and use CPAP post-op
- Patient/Family Education
 - Avoid supine position
 - Minimize opioids
 - If identified to have OSA by screening, contact primary care




Suggested Preoperative Evaluation

STOP-Bang Scoring Model

1. **Snoring:** Do you snore loudly
2. **Tired:** Do you often feel tired, fatigued, or sleepy during daytime?
3. **Observed:** Has anyone observed you stop breathing during your sleep?
4. **Blood pressure:** Do you have or are you being treated for high blood pressure?
5. **BMI:** BMI more than 35 kg/m²?
6. **Age:** Age over 50 yr old?
7. **Neck circumference:** Neck circumference greater than 40 cm?
8. **Gender:** Gender male?

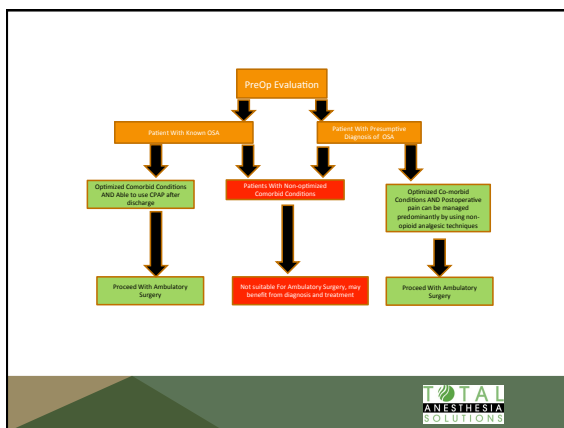
High risk of OSA: answering yes to three or more items
Low risk of OSA: answering yes to less than three items



One Group's Approach to ENT cases

- Sleep study documentation is required to characterize the severity of OSA and to exclude central sleep apnea.
- Patients with AHI>40 may not be suitable candidates for airway surgery in an ASC.
- Patients with a BMI >40-49.9 may not be suitable candidates for airway surgery in an ASC.
- Patients with an oxygen saturation nadir <75% on sleep study may not be candidates for the ASC. This is a precaution, but not an absolute exclusion.
- All patients with a history of sleep apnea that is moderate, moderately severe or severe and with a BMI > 40 should undergo a review by an anesthesiologist prior to the day of surgery.
- Patients having surgery on the tongue base or having surgery on multiple compartments (e.g., sinus and tonsils), are not suitable candidates for the ASC.





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 - Moore, et al Coron Artery Dis 1996;7:475
 - Gupta, et al Mayo Clinic Proc 2001;76:897
- Perioperative safety protocol
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Continued Education Credit

- 1 CE contact hour per attendee.
- Complete course evaluation by Wednesday May 5.
- Allow 2 weeks for processing of your certificate.
- Any questions regarding continued education contact courtney@pss4asc.com



Mark Your Calendars



May 22, 2017 11am PT/ 2am ET
**HOW TO EFFECTIVELY RESPOND
TO A DATA BREACH**

Kurt Bratten, Esq.
O'Connell & Aronowitz

July 24, 2017 11am PT/ 2am ET
PURCHASING AND SUPPLY CHAIN

Brian Vally
McKesson
