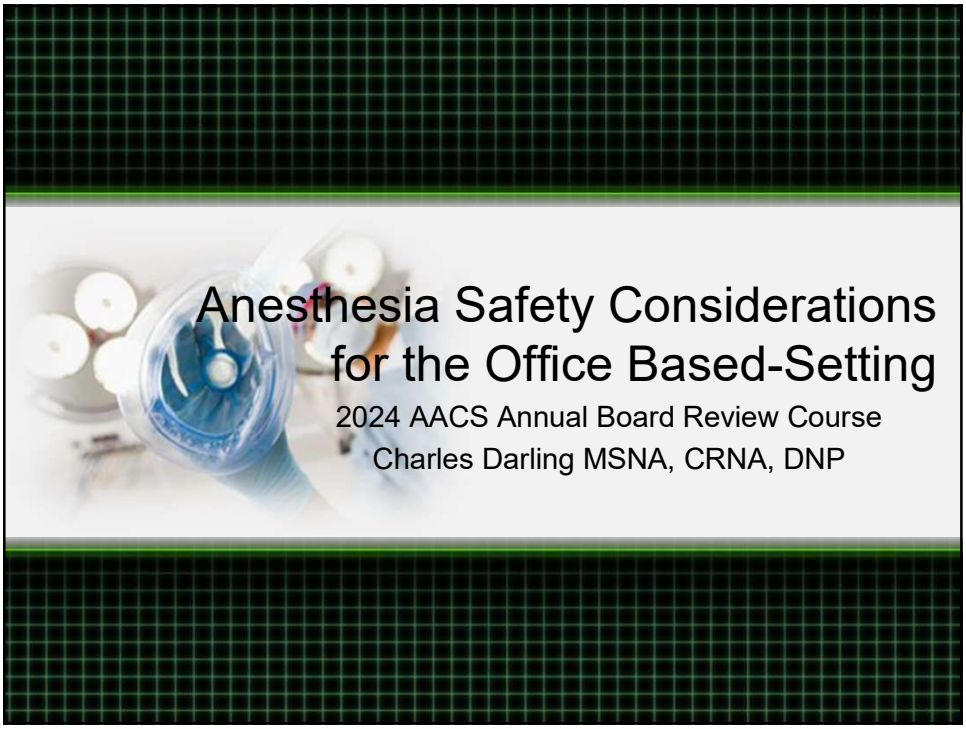

Anesthesia Safety Considerations for the Office Based-Setting

2024 AACS Annual Board Review Course

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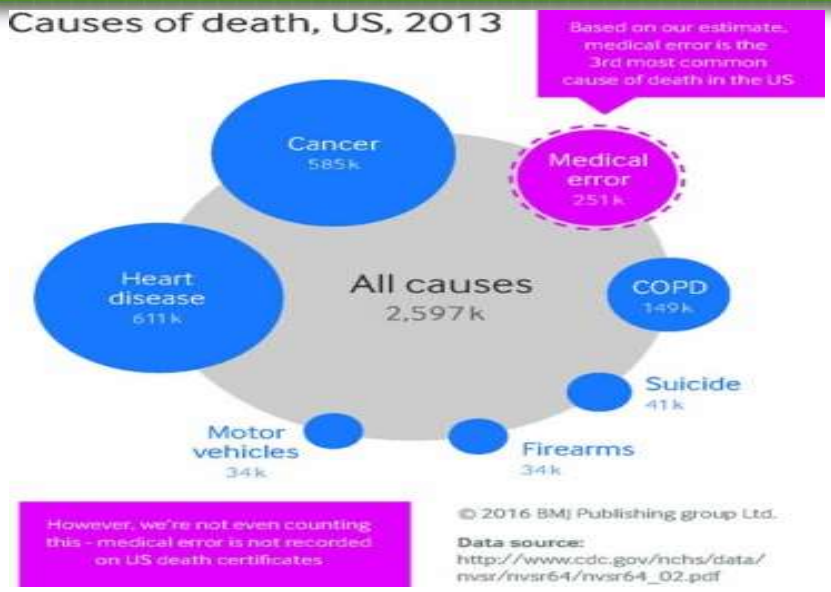
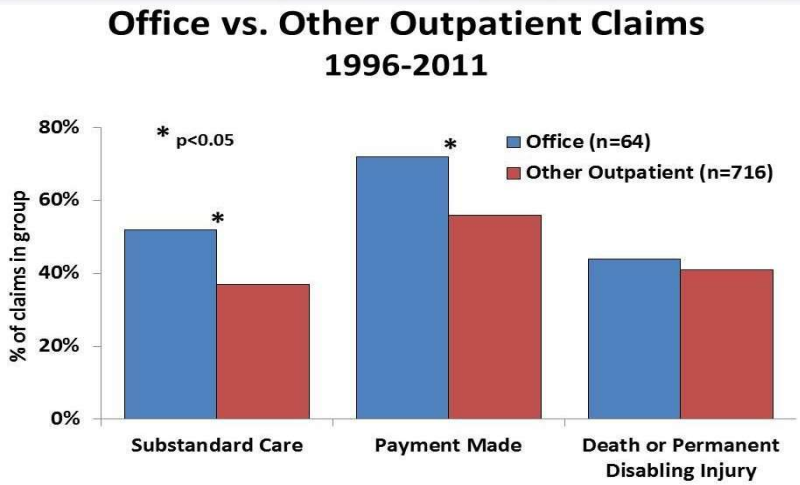
Preventable Medical Errors



Office vs. Outpatient Claims



Liability in Office-Based Anesthesia: Closed Claims Analysis. Anesthesiology, A2078, 2013

Closed Claims analysis of Office based cases vs. ASCs

- One study showed that office based claims were 3 times higher
  - 67% vs 21% deaths
  - 46% of office claims were deemed preventable by better monitoring (pulse oximetry in the post-op setting)
    - Involved mostly respiratory system events (50%)
      - Airway obstruction
      - Bronchospasm
      - Inadequate oxygenation-ventilation
      - Esophageal intubation
    - Drug related events (25%)
      - Wrong drug or dose
      - Malignant hyperthermia
      - Allergic drug reaction

Cases (added slide)

- 27- year old woman from Alabama died from respiratory failure shortly after returning home from office- based breast augmentation. Her death was attributed to effects of sedation administered during the procedure.
- A 28- year old woman from Virginia Beach , Virginia developed malignant hyperthermia during office anesthesia for breast augmentation. No dantrolene was available in the office setting. By the time she was transferred to an emergency department, her temperature was 107 degrees. She subsequently died.
- Five California children died during dental office procedures; four had been given oral chloral hydrate.

Guidelines for Office- Based Anesthesia

- Patient and procedure selection
- Intra-operative Risks
- Monitoring and equipment
- Emergencies and transfers

Surgeons and Anesthesia Providers Goal:

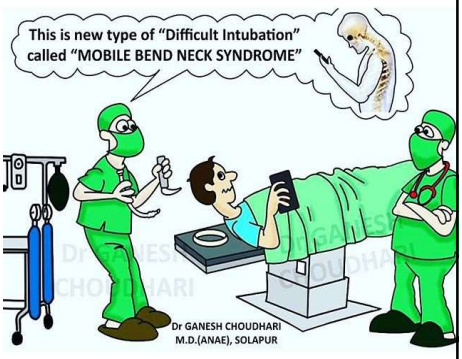
Reduce the cost of care without compromising the quality of care.

Patient Risk Stratification

- Identification of risk factors
- Low threshold for referring
- Should be ASA I, II, or III (if comorbidities are controlled)
- What is patient's BMI?
  - BMI> 30- Obese
  - BMI> 35- Severely Obese
  - BMI> 40 Morbidly Obese
  - BMI> 50 Super Obese

Airway Assessment (Review)

- Airway (Predictors of difficult airway)
  - Mallampati score (1-4)
  - Thyromental distance
    - TMD<6 cm
  - Cervical extension
  - ***Upper bite lip test***
  - Neck circumference
  - Range of motion of head/ head



- AIRWAY, AIRWAY, AIRWAY

Poor Candidates for an Office Based Setting

- Family history of Malignant Hyperthermia
- Poorly controlled systemic disease
  - Hx of uncontrolled diabetes
  - Hx of uncontrolled HTN
- Patients with moderate to severe OSA
- Patients with a pacemaker or AICD
  - Specifically those patients that are pacer dependent
- Patients with a history of a recent MI within 6 months
- CVA in last 3 months
- ***Show Stopper -Patients with a Positive Covid 19 test***
  - Symptomatic or potentially infective

Poor Candidates

- Lack of an adult escort
- Unstable psychological disease
- Acute substance abuse
- End stage renal disease, undergoing dialysis
- Sickle cell disease
- Myasthenia gravis

Inappropriate Procedures for an Office based Setting

- Prolonged duration (>6 hours)
- Significant blood loss or fluid shifts
  - Anticipated EBL > 500 ml
- Moderate to severe postoperative pain

Pre-op Tests

- HCG- patients with a uterus between menarche and menopause
- ECG
  - Diabetics
  - History of current cardiac disease
  - History of HTN
- Screen for Covid 19 symptoms
  - (fever, cough, shortness of breath, muscle pain, sore throat, and/or new loss of taste or smell) within the prior two weeks
- Covid PCR test within 3-5 days of surgery
  - Pt should self quarantine until DOS
- Labs
  - BMP
    - Patients on diuretics
  - CBC
    - Patients undergoing liposuction

Intraoperative Risks

- Hypothermia
- Duration of procedure
  - Wound infection
  - PONV
  - Hospital admission
- Venous Thromboembolism
  - Leading cause of mortality from cosmetic procedures
  - 1-2% incidence
  - Higher risks patients undergoing combined procedures, belt lipectomy, and abdominoplasty

Risk stratification and prevention measures for VTE

Identify patient related factors

- History of VTE
- Hormone replacement therapy
- Obesity
- Oral contraceptives
- Advanced age
- Recent travel
- Pregnancy
- Immobility
- Smoking
- Cancer
- Hypercoagulapathy disorders
- Recent MI
- Low flow states such as CHF

Risk stratification and prevention measures for VTE

- Procedural Risk factors
  - Use of general anesthesia
  - Longer procedures
  - Combined procedures; especially with abdominoplasty
- Prevention
  - Slight knee flexion during surgery
  - Positioning to prevent external pressure on lower extremities
  - Use of compression stockings
  - Use of sequential compression devices on lower extremities
  - Alteration of OR bed position during surgery

Why Is Obesity an issue in the office based setting?

SMWCUMM(23

- Obesity Results in:
  - Higher potential for difficult mask ventilation, laryngoscopy and intubation
    - 30% greater chance of difficult/ failed intubation
    - Large neck circumference > 17 in is associated with a 35% probability of difficult laryngoscopy
  - Reduced functional residual capacity
  - Significant atelectasis and shunting in dependent lung regions

Obesity

- Resting metabolic rate, work of breathing, and minute oxygen demand are increased
- Potential to be difficult to ventilate and prone to have increased peak airway pressures
- Susceptible to rhabdomyolysis depending on length of surgery and position

Obesity

- Increased likelihood of having OSA, HTN, Diabetes
- Increased morbidity and mortality from thrombotic disorders such as MI, stroke, and Venous thromboembolism (VTE)
- VTE 10 times higher in obese women
- Increased chance of having O2 desaturation after extubation
- Potential difficulty with IV placement

FIGURE 1A. Patient with super morbid obesity with large neck and a beard

STOP-BANG

- Screening questionnaire for OSA
  - **S**noring- do you snore loudly than talking or heard through a closed door?
  - **T**ired- Do you often feel tires, fatigued or sleepy during the daytime? Do you fall asleep in the daytime?
  - **O**bserved- Has anyone observed you stop breathing or choking or gasping during your sleep?
  - Blood **P**ressure- Do you have, or are you being treated for high blood pressure?
  - **B**MI- BMI > 35 kg m2
  - **A**ge- Age > 50 years
  - **N**eck- Circumference > 43 cm for males, >41 cm for females
  - **G**ender- Male

  One point is scored for each positive feature, score >= 5 is a significant risk

Co-existing Disease

- Approximately 40% of patients with HTN are untreated or inadequately treated
  - Ace inhibitors and angiotensin 2 receptor blockers need to be held for 24 hrs prior to surgery
- Cardiac Disease
  - Unstable angina patients are at the greatest risk for mortality
  - Prior MI- most prudent advice is to wait 6-12 weeks
- Respiratory Disease
  - Smoking stopped 6 weeks optimal for mucociliary clearance
  - Asthma- depends on reversibility of symptoms
- Endocrine Disease
  - DM- first case. Oral hypoglycemics OK, ½ insulin dose
  - Long term steroid users need perioperative supplement

Co-existing Disease

- Obstructive Sleep Apnea (OSA)
  - If left untreated, leads to pulmonary hypertension and heart failure
  - Increased susceptibility to anesthetic agents and opioids
    - Can lead to chronic hypoventilation and resp arrest
    - Use short acting narcotics and a multimodal approach
      - Torodol, Ofirmev, local anesthetic, regional technique
  - May require longer PACU stays
  - Does patient utilize CPAP?
    - CPAP needs to be brought into the office on DOS and placed on pt immediately after extubation
    - Need to be required to wear CPAP post-op

Concerns with OSA Patients undergoing ambulatory surgery

- Intra-op
  - Difficult/ failed mask ventilation or tracheal intubation
  - Difficulty maintaining adequate oxygenation
- Immediate post-op
  - Delayed extubation
  - Obstruction and/ or desaturation after extubation
  - Postobstructive pulmonary edema
  - Need for tracheal reintubation
  - Exacerbation of cardiac comorbidities
  - Cerebrovascular disorders
  - Prolonged post anesthesia care unit stay
  - Delayed discharge home
  - Unanticipated hospital admission
- Post discharge
  - Hypoxic brain death and death

Monitoring

- American Society of Anesthesia Standards of Care
  - VS every 5 min
  - O2 sat
  - Capnography
    - **The "GOLD Standard"**
  - Temperature
  - End Tidal Potent Inhaled Agent Monitoring
    - Recommended

Types of Anesthesia

- MAC
  - Effective use of local anesthesia required by surgeon will contribute to greater success
- Sedation
  - Oral
  - IV
  - N2O/ O2
- General
  - TIVA
  - Potent inhaled agents
- Tumescent
  - Tissue infiltration with NS/ Lidocaine/ Epi mix (Typically 30mg/kg but may go as high as 55mg/kg)

Liposuction

- Precautions to Be Taken
  - Intravenous fluids should be used with extreme caution in high volume liposuction (>4L)
    - Excess fluid administered can easily produce fluid overload
    - For every 1 liter fluid administered SQ, 700 ml is absorbed in the vascular space
  - Increased risk of hypothermia with high volume liposuction
    - Treatment
      - Warm betadine preparation fluid
      - Warm intravenous and wetting fluids 38-40deg C
      - Exposed body areas to be covered
      - Use Warmed Force Air
      - Maintain Operating room temperature 24 deg C
  - Contraindicated in patients with cardiovascular disease, clotting disorder, and pregnancy

Liposuction Aspirant Recommendations

- Restrict to 5000 ml in an office –based setting
- Limit to 2000 ml if performed with a concurrent aesthetic surgical procedure
- >5000 ml- recommended to perform in a hospital setting or licensed / accredited facility

Caution: large- volume liposuction with other procedures

Check State Statute

Liposuction Complications

- Hypothermia
- Thromboembolism (major cause of mortality)
- Pulmonary Fat embolism Syndrome
- Pulmonary Edema
- Lidocaine Toxicity/ epinephrine toxicity
- Hemorrhage
- Abdominal Viscous Perforation
- Sepsis
- ARDS
- Anemia
- Infection
- Fluid overload

Lidocaine Toxicity (Review)

- Local Anesthetic Toxicity
  - May have delayed onset
    - Post-tumescent absorption can occur several hours after surgery
    - Concentrations may rise for up to 16 hrs.
  - Symptoms in an awake patient
    - Circumoral numbness
    - Lightheadedness
    - Confusion
    - Tinnitus
  - Symptoms in a patient under general anesthesia
    - Seizures
    - Hypotension
    - Bradycardia
    - Irregular heart rhythm
    - Asystole

Case Scenario 1

- 36 yo 85 kg Female with no medical history having liposuction of her abdomen, waist and back done
  - Pt received 5800 ml Tumescence 4,675mg lidocaine and 5mg Epinephrine
  - Uneventful induction and intubation by the CRNA
  - Vitals after induction: 110/56, HR- 72, SPO2- 98%
  - After 2 hours into the surgery:
    - Pt starts to shiver which proceeds to seizure like activity
    - Exhibits the following in this sequence
      - BP- 60/48, HR- 42, SPO2- 94%
      - Complete heart block
      - Asystole

Lidocaine Toxicity (Review)

- Local Anesthetic Toxicity Treatment
  - Benzodiazapines for seizure control
  - O2
  - Vasopressors as needed
    - Epinephrine
  - Lipid Emulsion 20%
    - 1 ml/kg bolus over 1 minute followed by 0.25ml/kg/min
    - Repeat bolus every 3-5 minutes up to 3 ml/kg total dose until circulation is restored
    - Continue infusion until hemodynamically stability is restored, increase the rate to 0.5 ml/kg/min if BP declines
    - A max dose of 8 ml/kg is recommended
  - ACLS protocol/ Call 911

Lidocaine Toxicity (Review)

- Drugs that inhibit the metabolism of Lidocaine
  - Calcium Channel blockers
  - SSRIs- main offending class
  - Cimetidine
  - Beta blockers
  - Antibiotics
    - Floxins
    - Myacins
    - Antifungals

Risk for Airway Fires

- Types of Surgeries
  - Facelift
  - Blepharoplasty
  - Surgical site above the ziphoid

Prevention of Surgical / Airway Fires

- Discuss fire prevention and management during time-out
- Ensure appropriate draping techniques to minimize oxygen concentration under the drapes
- Assess that enough time has been allowed for alcohol-based prep solutions to dissipate (min of 3 minutes)
- Utilize wet sponges/ wet towels
- Moist throat pack
- Protect heat sources (eg. Holster)
- Ensure a basin of sterile saline and bulb syringe are available for fire suppression
- Fill ETT cuff with methylene blue saline if possible
- Maintain an FiO2 of 0.30 and avoid N20

Treatment of Airway Fires

- Call 911
- Surgeon:
  - Remove ETT
  - Remove airway foreign bodies
  - Pour saline into patient's airway
  - Examine airway to assess injury
- Anesthesia provider:
  - STOP all airway gas by disconnecting circuit from anesthesia machine
  - Once fire is extinguished, re-establish airway; avoid supplemental O2 if possible
  - Consider prompt re-intubation prior to swelling
  - Inspect ETT pieces to verify none left in airway
  - Save all materials

Emergency Procedures

- Policies for routine and emergency procedures should be in place
  - Malignant Hyperthermia
  - ACLS protocols
  - Emergency evacuation of patients
  - Operating room fires
  - Airway fires
- Staff trained on the above procedures
  - Annual or semi annual drills

Malignant Hyperthermia

- Malignant Hyperthermia (MH)
  - Abnormal release of calcium from SR of skeletal muscle cells
  - Triggering agents
    - Potent volatile anesthetics (iso, sevo, des)
    - Succinylcholine
  - Clinical Manifestations of MH
    - Elevated ETCO2 -Earliest sign
    - Muscle rigidity
    - Elevated temperature- LATE sign
    - Tachycardia
  - Laboratory manifestations
    - Hyperkalemia
    - Metabolic acidosis/ resp acidosis

MHAUS HOTLINE: 800-644-9737

Malignant Hyperthermia

- MH Treatment
  - Call for help/ Call 911
  - Stop inhalation agent
  - Take patient off ventilator and manual ventilate with an Ambu Bag
  - Hyperventilate with 100% FIO2
  - Bicarbonate 1-2 mg/kg as needed
  - Utilize TIVA
    - Propofol
    - Ketamine
    - Non-depolarizing muscle relaxants
    - Opioids
    - anxiolytics

Malignant Hyperthermia

- Administer Dantrolene 2.5mg/kg IV STAT and repeat PRN to control signs of MH
  - 20mg/ bottle mixed with 60 ml sterile water
    - Shake vigorously or warm bottle to dissolve
  - Needs to be continued 24-48 hours
- Cool patient
  - Insert OG and institute gastric lavage with ice water
  - Ice packs to head, axilla, and groin
- Treat arrhythmias and start ACLS protocol
- Transport to nearest medical facility

Malignant Hyperthermia Update

Dantrolene

- 20 mg per vial
- ***>15min to prepare***
- 750ml sterile water needed
  - Based on a 100kg patient
- 2 or more staff needed
- Conc after reconstitution
  - 20mg/ 60ml
- Cost= $3,000 (8 vials)
- Shelf life= 3 years
- Vials req'd to stock= 36

Ryanodex

- 250mg per vial
- ***< 1 min to prepare***
- 5ml sterile water needed
- Only 1 person needed
- Conc after reconstitution
  - 250mg/5ml
- Cost= $6900 (1 vial)
- Shelf life= 2 years
- Vials req'd to stock= 3

Airway Emergencies

- Airway compromise
  - Obstruction
    - Stridor, flared nostrils, decreased breath sounds, no CO2
  - Bronchospasm
    - Asthma, secretions, painful stimuli
  - Laryngospasm
    - Blood in the airway, too light
- Negative pressure pulmonary edema
  - Can occur rapidly when patient is attempting to breathe against an obstructed airway

Anaphylaxis

- Anaphylaxis
  - Nonimmunologic response- histamine is the only mediator released
    - Propagated by drugs such as vancomyocin, protamine, **NMDRs**, morphine
      - Rocuronium is the most common drug used in anesthesia to cause anaphylaxis
  - Immunologic response- chemical mediators : histamine, peptide mediators, leukotrienes, prostaglandins, kinins, platelet-activating factor
  - Allergic rxn to drugs occur within 3 minutes
  - Only intraop manifestation may be hypotension

Anaphylaxis

- Respiratory
  - Cough, wheezing, pulm edema, resp. failure
- Cutaneous
  - Uticaria, flushing, periorbital edema
- CV
  - Hypotension
  - Tachycardia
  - Dysrhythmias
  - Pulm HTN
  - Arrest

Anaphylaxis

- Treatment
  - Pretreat with benadryl
  - Epinephrine 5-10 mcg IV
    - Treats hypotension
    - Bronchodilates
  - 100 % O2
  - Secure airway
  - IV fluids
  - Albuterol
  - H1/H2 blocker combo
    - Benadryl/ ranitidine (zantac)
  - Steroids

Be aware that unexplained CV collapse has been attributed to anaphylaxis triggered by latex

Follow up with an allergist to determine triggering agent

Airway Rescue Devices

- Ambu bag
- Oral / nasal airways
- LMAs
  - Fast trach
  - Intubating LMA
- **Glidesope/ McGrath**
- Lightwand
- Bougie
- Cricothyrotomy







ACLS Protocols

- Crash cart with emergency drugs and defibrillator, suction, airway devices, fluids, IV equipment to include intraosseous needles
- 20% lipid emulsion to treat systemic toxicity of local anesthetics
- Drugs for MH crisis
  - Sodium bicarb
  - Dantrolene (newest preparation- Ryanodex)
- Anesthesia provider, nurse,

and surgeon are BLS & ACLS certified

- PALS certification for children
- Have a plan and perform mock code drills!!

Case Scenario #2

- 42 yo female ASA1 having a Breast Augmentation
  - Nice smooth induction by CRNA with LMA placement
  - After Case proceeds
    - O2 sats 90%
    - ECG rhythm shows the HR increased from 74 to 124 initially
    - BP decreased from 134/78 to 74/56
  - 10 minutes later
    - O2 sats – no reading
    - ECG rhythm shows a HR of 88
    - BP not reading
    - Decreasing Tidal Volumes
    - Decreased ETCO2
  - What are your next actions?

PEA/ Asystole Treatment

- Call 911
- Initiate CPR
- Ensure 100% FIO2 and ventilate
  - If unable to ventilate effectively via LMA, than intubate
- Epinephrine 1 mg IV every 3 minutes
- Re-assess every 2 minutes
- Assess the Hs & the Ts
  - Hypoxia - Tension Pneumothorax
  - Hypothermia - Cardiac Tamponade
  - Hypo/Hyperkalemia - Toxins
  - Hydrogen ions (acidosis) - Thrombosis (coronary/ pulm)
  - Hypovolemia - Trauma
  - Hypoglycemia

PEA/ Asystole Treatment

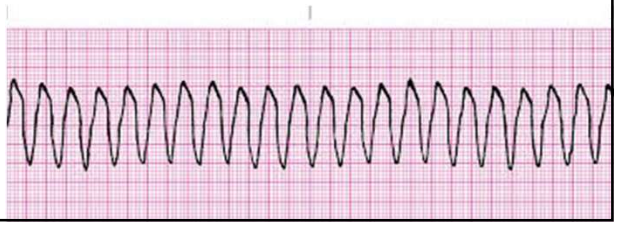
- Specific to this Patient
  - Fluid Bolus (1-2 L LR/ NS)
  - Needle decompression once diagnosis of Tension Pneumothorax has been confirmed
    - 2nd ICS, midclavicular
    - 4th ICS, midaxillary
    - Use large bore catheter (14-16 g needle) on affected side
    - Insert cephalad to rib body to avoid NV bundle
    - Should hear a whoosh of air if under tension
  - Immediately follow up needle decompression with a chest tube
  - Once ROSC, maintain hemodynamics with vasopressors if needed
  - Transfer patient to nearest hospital via Ambulance

Remember DOPE

- Displacement of tube
- Obstruction of tube
- Pneumothorax
- Equipment failure

Case Scenario #3

- 68 yo female with a history of HTN and GERD and an MI 10 years ago
  - Nice smooth induction & intubation by CRNA
  - Initial Vitals: BP-130/74, HR- 84, SPO2- 97%
  - After 45 minutes into the Surgery:
    - The following rhythm is noted on the monitor
    - No pulse detected
    - CRNA informs surgeon
  - What are your next actions???



Pulseless VT/ V Fib Treatment

- Call 911
- CPR
- Immediately Defibrillate with 120J if biphasic defibrillator
- Resume CPR for 2 minutes (5 cycles)
- Administer epinephrine 1 mg IV every 2-3 minutes
- Defibrillate with 200J
- Administer 1mg/kg of Lidocaine IV or 300mg Amiodarone IV
- Think of the Hs & Ts
- If ROSC is obtained,
  - Transfer to nearest hospital
  - Maintain hemodynamics with vasopressors if needed to maintain a SBP>95
  - Keep patient cool if unconscious

FOOD FOR THOUGHT !!!

- Implementation of an Office based surgical safety checklist
  - Retrospective chart review
    - Total number of complications per 100 patients decreased from 15.1 to 2.72 after checklist
    - Site and side marking increased from 69.9% to 97.8%
    - Medical optimization increased from 90.9 to 99.5%
    - Assessment of patient satisfaction increased from 57.1 to 90.8%

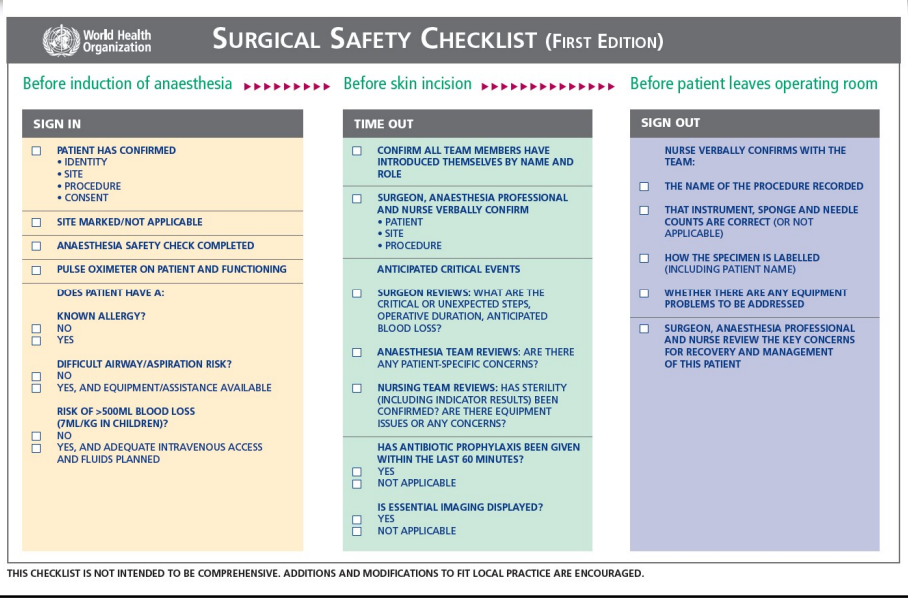
FOOD FOR THOUGHT !!!

- Reasons to institute an emergency manual (According to Stanford University)
  - Better management during critical events
  - Used by pilots and nuclear power plant operators
  - Unable to access relevant literature during a critical event
  - Stress worsens our memory and the distractions interrupt our planned actions
  - Expertise requires significant repetitive practice

Checklists

- World Health Organization (WHO)
- Institute for Safety in Office-Based Surgery (ISOBS)
- Stanford Cognitive Aid Group- Emergency check list

Example of a Checklist by the World Health Organization (WHO)



World Health Organization

SURGICAL SAFETY CHECKLIST (FIRST EDITION)

Before induction of anaesthesia ▸▸▸▸▸▸▸▸▸ Before skin incision ▸▸▸▸▸▸▸▸▸▸▸▸▸ Before patient leaves operating room

SIGN IN

☐ PATIENT HAS CONFIRMED
- IDENTITY
- SITE
- PROCEDURE
- CONSENT

☐ SITE MARKED/NOT APPLICABLE

☐ ANAESTHESIA SAFETY CHECK COMPLETED

☐ PULSE OXIMETER ON PATIENT AND FUNCTIONING

DOES PATIENT HAVE A:

KNOWN ALLERGY?
☐ NO
☐ YES

DIFFICULT AIRWAY/ASPIRATION RISK?
☐ NO
☐ YES, AND EQUIPMENT/ASSISTANCE AVAILABLE

RISK OF >500ML BLOOD LOSS (7ML/KG IN CHILDREN)?
☐ NO
☐ YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED

TIME OUT

☐ CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE

☐ SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM
- PATIENT
- SITE
- PROCEDURE

ANTICIPATED CRITICAL EVENTS

☐ SURGEON REVIEWS: WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?

☐ ANAESTHESIA TEAM REVIEWS: ARE THERE ANY PATIENT-SPECIFIC CONCERNS?

☐ NURSING TEAM REVIEWS: HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?

HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES?
☐ YES
☐ NOT APPLICABLE

IS ESSENTIAL IMAGING DISPLAYED?
☐ YES
☐ NOT APPLICABLE

SIGN OUT

NURSE VERBALLY CONFIRMS WITH THE TEAM:

☐ THE NAME OF THE PROCEDURE RECORDED

☐ THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT (OR NOT APPLICABLE)

☐ HOW THE SPECIMEN IS LABELLED (INCLUDING PATIENT NAME)

☐ WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED

☐ SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT

THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.

Checklist recommended by the ISOBS

Safety Checklist for Office-Based Surgery

from the Institute for Safety in Office-Based Surgery (ISOBS)

Introduction
Preoperative encounter; with practitioner and patient

Patient

Patient medically optimized for the procedure?
☐ *Yes*
☐ *No, and plan for optimization made.*

Does patient have DVT risk factors?
☐ *Yes, and prophylaxis plans arranged.*
☐ *No*

Procedure

Procedure complexity and sedation/analgesia reviewed?
☐ *Yes*

NPO instructions given?
☐ *Yes*

Escort and post-procedure plans reviewed?
☐ *Yes*

Setting
Before patient in procedure room; with practitioner and personnel

Emergency equipment check complete (e.g. airway, AED, code cart, MH kit)?
☐ *Yes*

EMS availability confirmed?
☐ *Yes*

Oxygen source and suction checked?
☐ *Yes*

Anticipated duration ≤ 6 hours?
☐ *Yes*
☐ *No, but personnel, monitoring and equipment available*

Operation
Before sedation/analgesia; with practitioner and personnel*

Patient identity, procedure, and consent confirmed? ☐ *Yes*

Is the site marked and side identified?
☐ *Yes* ☐ *N/A*

DVT prophylaxis provided?
☐ *Yes* ☐ *N/A*

Antibiotic prophylaxis administered within 60 minutes prior to procedure? ☐ *Yes* ☐ *N/A*

Essential imaging displayed?
☐ *Yes* ☐ *N/A*

Practitioner confirms verbally:

☐ **Local anesthetic toxicity precautions**

☐ **Patient monitoring (per institutional protocol).**

☐ **Anticipated critical events addressed with team.**

☐ **Each member of the team has been addressed by name and is ready to proceed.**

Before discharge
On arrival to recovery area; with practitioner & personnel

Assessment for pain?
☐ *Yes*

Assessment for nausea/vomiting?
☐ *Yes*

Recovery personnel available?
☐ *Yes*

Prior to discharge:
(with personnel and patient)

Discharge criteria achieved?
☐ *Yes*

Patient education and instructions provided?
☐ *Yes*

Plan for post-discharge follow-up?
☐ *Yes*

Escort confirmed?
☐ *Yes*

Satisfaction
Completed post-procedure; with practitioner and patient

Unanticipated events documented?
☐ *Yes*

Patient satisfaction assessed?
☐ *Yes*

Provider satisfaction assessed?
☐ *Yes*

This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged. *Adapted from the WHO Surgical Safety Checklist.

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Emergency Manual Checklist

EMERGENCY NUMBERS:

To download free copy with CC licensing : HTTP://EMERGENCYMANUAL.STANFORD.EDU
To report adverse events & near misses: WWW.AQIAIRS.ORG

EMERGENCY MANUAL

COGNITIVE AIDS FOR PERIOPERATIVE CRITICAL EVENTS 2014, V2.1

STANFORD ANESTHESIA COGNITIVE AID GROUP

BRONCHOSPASM

(Intubated Patient)

By Stanford Anesthesia Cognitive Aid Group

SIGNS

1. Increased peak airway pressures.
2. Wheezing on lung exam.
3. Increased expiratory time.
4. Increased $ETCO_2$ with upsloping $ETCO_2$ waveform.
5. Decreased tidal volumes if pressure control.

CALL FOR HELP **CODE CART?**

INFORM TEAM

Bronchospastic patients that develop sudden hypotension may be airtrapping – disconnect patient from circuit to allow for complete exhalation.

TREATMENT

1. Increase to **100% O_2**, high flow
2. Change I:E time to allow for adequate exhalation
3. Deepen volatile anesthetic (sevoflurane is non-irritating)
4. Rule out mainstem intubation or kinked ETT. Suction ETT
5. Administer inhaled agents: Beta 2 agonist (**albuterol**, multiple puffs required) +/- anticholinergic (**Ipratropium**)
6. If severe consider **epinephrine** (start with 10 µg IV and escalate, monitor for tachycardia and hypertension)
7. Consider **ketamine**: 0.2 – 1.0 mg/kg IV
8. Consider **hydrocortisone** 100 mg IV
9. Consider **nebulized racemic epinephrine**
10. Rule out anaphylaxis (hypotension/tachycardia/rash) **Go to** Anaphylaxis event
11. Consider ABG

DIFFICULT AIRWAY

UNANTICIPATED

By Stanford Anesthesia Cognitive Aid Group and Vladimir Nekhendzy, MD

If unable to see vocal cords or pass ET tube during first Direct Laryngoscopy (DL):

1. Consider **External Laryngeal Manipulation**, BURP (Backwards Upwards Rightwards Pressure)
2. Consider placing **Bougie** introducer
3. **Limit total number of DL attempts to 2**
4. Before repeating DL, consider mask ventilation with oral/nasal airways
5. Consider optimizing patient position and/or blade selection
6. Consider **Video Assisted Laryngoscopy**
7. **If successful, confirm placement with $ETCO_2$ and bilateral breath sounds**

Can NOT Intubate

Attempt face mask ventilation – consider oral airway
Call for Difficult Airway cart

Can NOT Ventilate

Successful Ventilation

CALL FOR HELP!
PLACE ORAL, NASAL AIRWAY
SWITCH TO TWO-HANDED
MASK VENTILATION

If at any point Inadequate Ventilation by Mask or LMA
Go to Red Box

If ventilation remains adequate, Consider:

1. Awakening patient
2. Complete case with LMA or Face Mask
3. Video Assisted Laryngoscopy
4. Asleep fiberoptic bronchoscopy
5. LMA as conduit for intubation or intubating LMA
6. Retrograde wire intubation

Can NOT Ventilate

Place LMA if feasible
Consider any SGA, intubating LMA, Combitube or Laryngeal Tube

Successful Ventilation

Can NOT Ventilate

Emergency Airway Ventilation

1. Call for Surgical Help
2. Attempt: Cricothyrotomy (percutaneous kit or surgical cricothyrotomy)
3. Consider Jet Ventilation until above available
4. Confirm successful placement with $ETCO_2$ and bilateral breath sounds

For more details, see latest ASA Practice Guidelines for the Management of Difficult Airway

Errors that can Occur

- Inappropriate patient dosing
- Inappropriate fluid replacement
- Lack of vigilance in monitoring
- Poor airway management or planning
- Poor patient selection

Medico-legal Perspective

- Standard of Care
  - Defined as what a similarly trained, competent anesthesia provider might have chosen to do given the same circumstances
  - Does not vary between office and hospital operating rooms
  - Complications resulting in malpractice litigation against anesthesia providers can stem from problems in any stage of the process from pre-op evaluation to discharge

Positioning (Key points)

- Arms need to be positioned supinated vs. pronated
  - Prevents the ulnar nerve from a compression injury
  - Arm straps need to be placed in order to prevent too much compression and should be placed on the forearm
- Arms need to be less than 90 degrees
  - Prevents humeral head from being pushed into the axillary neurovascular bundle
  - Prevents the brachial plexus from being stretched

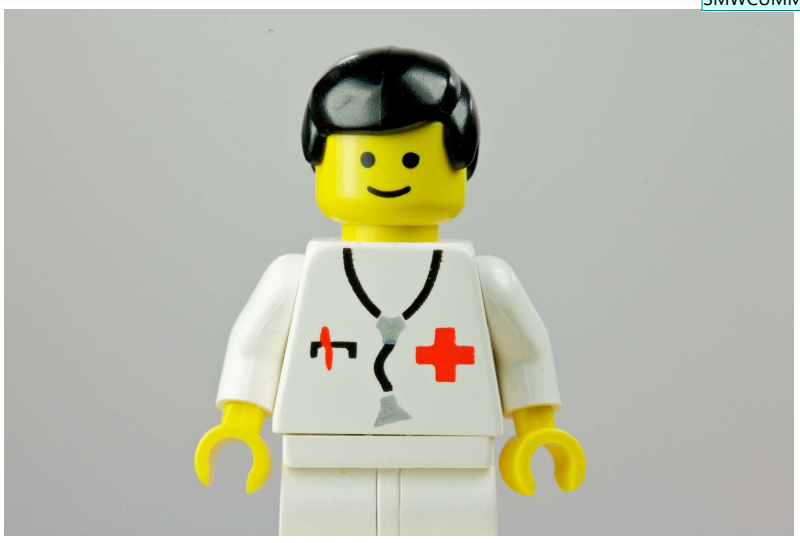
Providing safe care to the patient!!!

Available Resources for Office Based Anesthesia

- American Association of Nurse Anesthetists (AANA)
- American Society of Anesthesiologists (ASA)
- Society for Ambulatory Anesthesia (SAMBA)
- Institute for Safety in Office Based Surgery (ISOBS)

Questions????

SMWCUMM(48



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