

Cigarette Smoking Cessation

Risk

- In USA, approximately 21% of adults smoke tobacco; prevalence varies inversely with socioeconomic class; men > women (26% vs. 15%).
- Minorities more likely to smoke and less likely to quit.
- Prevalence among adults and teens declining, but growing evidence that teens using electronic cigarettes may be more likely to try other tobacco products.

Perioperative Risks

- Current smokers at increased risk of pneumonia, sepsis, unplanned intubation, mechanical ventilation, cardiac arrest, MI, stroke, and death.
- Increased periop morbidity and mortality related to smoking-associated diseases.
- Probability of morbidity and mortality increase with number of packs smoked per year.

Worry About

- Undiagnosed or poorly treated smoking-related disease (CAD, COPD, cerebrovascular, and peripheral arterial disease) that may affect a safe anesthetic plan

- Propensity for bronchospasm, coughing, decreased pulm reserve, and mucus plugging
- Decreased O₂ content secondary to high COHb levels
- Increased heart rate and BP secondary to nicotine in pts who have smoked just before anesthesia
- Home exposure to second-hand smoke and increase risk of periop pulm complications in children (laryngospasm and asthma)

Overview

- Smoking results in acute changes in cardiopulmonary function, even in otherwise asymptomatic patients. With long-term use, smoking causes chronic changes in cardiopulmonary function that eventually culminate in irreversible cardiopulmonary disease.
- Acute changes include carbon monoxide-mediated decreases in O₂ content and nicotine-induced increases in heart rate and BP. Nicotine-mediated effects are relatively short-lived, whereas COHb persists for many hours.
- Chronic changes include a gradual decline in lung function, consisting of decreases in FEV₁, mucociliary activity, gas exchange, and pulm macrophage activity.

- Associated diseases including CAD, COPD, cerebrovascular disease, and numerous cancers (lung, laryngeal, oral, stomach, bladder, and others).

Etiology

- Acquired behavior that is generally viewed as addiction (both physical to components of tobacco, e.g., nicotine, and psychological/social)
- Risk factors: low education level, low socioeconomic status, and early age of smoking onset

Usual Treatment

- During periop period, pts may be more open to and successful in quitting, and anesthesiologists have a role in urging pt to quit.
- Counseling by anesthesiologists, surgeons, and other counselors.
- Group therapy (e.g., a “12-step” program).
- Pharmacologic adjuncts (e.g., nicotine replacement gum/patch/pill, bupropion, varenicline).
- Referral to quitting resources (e.g., Quit Line phone resource, hospital counselors, state health programs) if possible during periop visits.

Assessment Points

System	Effect	Assessment by Hx	PE	Test
HEENT	Oral/laryngeal cancer	Hoarseness	Oral exam (and inspection during direct laryngoscopy)	
CV	CAD (±LV function) Cerebrovascular disease	Exertional chest pain, dyspnea, poor exercise tolerance, orthopnea, paroxysmal nocturnal dyspnea	S ₃ gallop, dysrhythmia, carotid bruit	EKG, stress test, ECHO, angiography
RESP	COPD	Dyspnea, poor exercise tolerance	Tachypnea, rales, wheezing and pursed-lip breathing	CXR, ABG
OTHER	Increased carboxyhemoglobin (with recent smoking)	Dyspnea	Tachycardia, tachypnea, hypoxia	ABG with co-oximetry (measure CoHb %)

Key References: Gronkjaer M, Eliassen M, Skov-Ettrup LS, et al.: Preoperative smoking status and postoperative complications: a systematic review and meta-analysis, *Ann Surg* 259(1):52–71, 2014; Lee SM, Landry J, Jones PM, Buhrmann O, Morley-Forster P: Long-term quit rates after a perioperative smoking cessation randomized controlled trial, *Anesth Analg* 120(3):582–587, 2015.

Perioperative Implications

Preoperative Preparation

- Advise smoking cessation for at least 12 h before operation (COHb levels fall to near-normal).
- Advise that a longer period of cessation (i.e., ~2 mo) may be necessary to achieve a decrease in postop pulm morbidity. Cessation may rarely be worthwhile in pts with severe pulm disease undergoing a major procedure.
- Suggest that now is an excellent time to quit smoking (reduce future disease risk, improve postsurgical wound healing, recovery, and reduce smoking-related aging).
- Evidence suggests that both the anesthesiologist's reinforcement and in-hospital tobacco cessation programs consisting only of a brief education and counseling visit, self-help take-home materials, and a follow-up phone call are cost-effective in promoting cessation.

- Employ “5 A's”: Ask, Advise, Assess, Assist, and Arrange for tobacco cessation

Monitoring

- Routine monitoring
- Most SpO₂ monitors do not distinguish between COHb and oxyhemoglobin. Significant levels of COHb may exist without decrease in SpO₂ reading (obtain ABG with cooximetry if concern exists).

Airway

- Smokers vulnerable to bronchospasm or mucus plug obstruction anytime.
- Children with second-hand smoke exposure may be at increased risk of laryngospasm.

Induction

- Avoid instrumentation of airway until deep level of anesthesia achieved.
- Provide complete preoxygenation because pts have lower tolerance of apnea.

Maintenance

- Follow routine and ensure adequate depth of anesthesia to avoid bronchospasm.

Extubation

- Consider deep extubation if other considerations permit to avoid bronchospasm (e.g., empty stomach, easy laryngoscopy)
- Well-timed IV opioid aids in cough suppression.

Postoperative Period

- Monitor for respiratory complications (e.g., pneumonia, bronchospasm).
- Continue to encourage permanent smoking cessation.
- Ensure pt does not attempt to smoke in presence of supplemental O₂.

Anticipated Problems/Concerns

- Propensity for bronchospasm and mucus plugging.
- Decreased O₂ content secondary to high COHb levels.

Cleft Palate

Brenda C. McClain

Risk

- 1 per 800 live births
- Frequently associated with cleft lip
- Gender predominance: Cleft lip/palate more common in males (2:1); isolated cleft palate more common in females (3:1)

Perioperative Risks

- Morbidity and mortality extremely low; only five life-threatening cases of postop airway obstruction described in the literature.

Worry About

- Difficult airway with associated anomalies of head and neck as in syndromes such as Shprintzen, 4P, or Pierre Robin
- Submental obstruction of airway during mask ventilation; view on laryngoscopy obstructed by tongue

- Laryngospasm on anesthetic induction and airway obstruction due to chronic URIs, chronic otitis media, and/or tongue becoming wedged in the cleft
- Difficult intraop oxygenation due to chronic aspiration syndrome
- Increased risk for transfusion if anemic due to poor ability to feed
- Intraop airway obstruction and extubation by Dingman gag
- Intraoperative dysrhythmias caused by surgical infiltration of epinephrine
- Postop airway obstruction by forgotten pharyngeal packs and severe lingual edema
- Undiagnosed associated congenital heart and renal diseases

Overview

- Congenital condition occurs by 7th–12th wk of intrauterine life and is multifactorial, but it can be associated with a single cause such as benzodiazepine usage.
- Cleft palate repair at 12–18 mo; cleft lip closed at 3 mo if also present; single to multiple stage methods employed dependent on type of defect(s).
- Usually not associated with severe blood loss.
- Postop airway obstruction may occur more frequently in prolonged procedures.
- A tongue stitch is often placed at end of surgery for management of possible airway obstruction, and it is removed the next day.

Usual Treatment

- If child is in otherwise good health, a palatoplasty is performed electively.
- All children with cleft palate should have repair by 18 mo to ensure:
 - Normal speech development
 - Appropriate social integration
 - Normal growth of maxilla

Assessment Points

System	Effect	Assessment by Hx	PE	Test
HEENT	Otitis media Clear rhinorrhea Difficult airway	Ear pain Snore, grunt	Temporomandibular exam Airway exam (micrognathia)	
CV	Associated congenital heart disease	SOB, cyanosis, poor growth	CV exam, club foot	ECG, ECHO
RESP	URI Aspiration	Cough, fever Congestion SOB, cyanosis	Chest exam Chest exam	CXR
GI	Impaired deglutition Malnutrition	Nasal regurgitation Poor growth		Observe feeding
HEME	Anemia	Malnutrition	Pallor	Hgb/Hct
RENAL	Associated congenital defects	UTI	Club feet	UA, BUN/Cr

Key References: Chiono J, Raux O, Bringuier S, et al.: Bilateral suprazygomatic maxillary nerve block for cleft palate repair in children, *Anesthesiology* 120(6):1362–1369, 2014; Steward DJ: Anesthesia for patients with cleft lip and palate, *Semin Anesth Periop Med Pain* 26(3):126–132, 2007.

Perioperative Implications

Preoperative Preparation

- Recognize possibility of multiple future procedures and attempt to minimize stress during induction. Consider oral premedication.

Anesthetic Technique

- GA, usually induced via a mask and using increasing concentrations of volatile agent in O₂, to avoid paralysis until airway is secured.
- Oral airway or gauze packing of cleft may help manual ventilation by preventing tongue from lodging in cleft.

- Intubation, often with RAE ETT secured to mandible, because access to airway may be severely limited.

Monitoring

- Precordial stethoscope, pulse oximeter, and noninvasive BP measurement.
- Maintain normocapnia if epinephrine injection is used.

Postoperative Considerations

- Significant risk for airway obstruction due to edema
- Often obligate mouth breathers
- Judicious use of opioids in a monitored setting; rectal acetaminophen is helpful, especially in combination with suprazygomatic maxillary nerve blocks

Anticipated Problems/Concerns

- Airway difficulty during induction and intubation, especially when associated with other facial anomalies
- Postop airway obstruction due to forgotten pharyngeal pack, severe lingual edema, or obligate mouth breathing

Coagulopathy, Factor IX Deficiency

Thomas M. McLoughlin Jr.

Risk

- Within USA, approximately 4000 persons are affected (20% of all hemophiliacs): incidence: 1:25,000–30,000 males; 75–100 are people born with the disease in USA each year.
- No racial prevalence.
- Highest prevalence overwhelmingly in males.

Perioperative Risks

- Increased risk of hemorrhagic complications from any procedure.
- Of affected individuals, 60% have severe disease (<1% normal circulating factor IX).
- Of carrier females, 10% have abnormal hemorrhage risk.

Worry About

- Excessive and/or uncontrollable hemorrhage
- Tendency for recurrent hemorrhage after initial control
- Expansive deep and soft-tissue hematomas
- Increased risk if hepatic dysfunction from prior plasma product transfusions

Overview

- Inherited; also called hemophilia B or Christmas disease.
- Very similar to hemophilia A (classic hemophilia), but with somewhat less severe bleeding frequency and severity.
- Hemarthrosis accounts for 75% of bleeding episodes. Chronic debilitating arthritis is a common development.
- Soft-tissue hematomas and hematuria also common.
- Intracranial hemorrhage is most common fatal complication.
- Disease severity proportional to circulating factor IX activity (<1% normal activity = severe disease; >5% = generally mild disease).
- Modern maintenance factor replacement treatment results in normal life expectancy.

Etiology

- Sex-linked recessive disorder.
- 70% of cases inherited; 30% result from spontaneous mutation.

- Acquired factor IX deficiency associated with liver disease.
- Adult levels may not be reached in healthy newborns until 6 mo of age.

Usual Treatment

- Restoration of circulating factor IX activity; biological half-life is 18–24 h.
- Plasma-derived pooled factor IX concentrates (AlphaNine SD, Mononine).
- Recombinant factor IX concentrates (BeneFIX [Pfizer], Rixubix [Baxter], and Ixinity [Emergent]) along with an extended half-life (approximately 86 h) recombinant product (Alprolix [Biogen]).
- Of patients in USA, >75% use recombinant products for maintenance therapy.
- In vivo effect of recombinant factor IX products is less than that of plasma-derived products.
- Rarely (3–5% of pts), acquired alloantibodies to administered factor IX substantially complicate treatment.
- Prothrombin complex concentrates and FFP are alternatives for life-threatening hemorrhage if concentrates unavailable.