Assessment Points

System	Effect	Assessment by Hx	PE	Test
CARDIO	Htn	Usually asymptomatic; may have signs of urgency/emergency	Normal if treated S_4 if longstanding Htn/ LVH	Baseline vital signs ECG TTE Exercise or pharmacologic stress test Radionuclide studies
	CAD	Angina or equivalent, may be asymptomatic	May detect new murmur or signs and Sx of heart failure	Coronary angiography
	CHF	Exercise intolerance Sx of heart failure	S_3, JVD, rales, hepatomegaly	
VASC	Occlusive lesions	Claudication	Cool, mottled extremities Ulcer or gangrene Decreased pulses	ABI Peripheral angiography Abdominal US/CTA/MRA
	May have concomitant AAA	Abd pain, may be asymptomatic	Pulsatile abdominal mass	
RESP	Concurrent tobacco abuse May have COPD	DOE Chronic cough Home O_2/inhaler requirement	Decreased breath sounds Prolonged expiration Wheezes Focal rales may indicate superinfection	CXR ABG PFTs
RENAL	CRI	Need for HD/PD	Edema	BUN/Cr Baseline lytes
ENDO	DM and assoc effects such as peripheral and autonomic neuropathy, nephropathy	Attention to CV, PNS for ANS and other evaluation	Obesity (in DM type II) Retinopathy Cardiomegaly Foot ulcers	Fasting blood sugar (acute control) HgbA1C (long-term control)
CNS	Cerebrovascular disease	Stroke/TIA symptoms Scotoma	CNS exam Search for carotid bruits	CT/MRI brain Doppler or angio (if indicated)

Key References: Norgren L, Hiatt WR, Dormandy JA, et al.: Inter-society consensus for the management of peripheral arterial disease (TASC II), *J Vasc Surg* 45(Suppl S):S5–S67, 2007; Anton JM, McHenry ML: Perioperative management of lower extremity revascularization, *Anesthesiol Clin* 32(3):661–676, 2014.

Perioperative Implications

Preoperative Preparation

- Aggressive management of medical comorbidities
- Continue ASA, beta-blocker, ACE-I, and statin periop. Maintain normoglycemia and encourage smoking cessation.
- Clinical symptomatology may make functional status difficult to ascertain. Consider preop stress test for pts with poor or unknown functional status.

Monitoring

- ST-segment analysis for myocardial ischemia.
- Consider invasive arterial pressure monitoring, particularly for open procedures.
- Central pressure monitoring rarely indicated.

Airway

- Open procedures successfully performed with GA (ETT vs. LMA), neuroaxial anesthesia, or RA.
- Endovascular procedures typically performed under MAC with a natural airway.

Preinduction/Induction

- Tachycardia increases myocardial oxygen demand and decreases myocardial oxygen supply (less time in diastole)
- Htn increases LV stress; hypotension risks decreased perfusion of likely hypertrophied LV.

Maintenance

- No significant outcomes or differences between anesthetic techniques, even for pts with more severe disease or CLI.
- Neuroaxial techniques may increase vascular blood flow, improve graft patency rates, and decrease need for reintervention.
- Endovascular repairs typically performed under light sedation to allow for pt cooperation.

Extubation

- Sympathetic stimulation and resultant hypertension/tachycardia are to be avoided.

Adjuvants

- Neuroaxial catheters can be used for adjuvant pain control and may have benefits for graft patency. Risk/benefit of neuroaxial anesthesia must be weighed against need for periop anticoagulation.

Anticipated Problems/Concerns

- Periop complications include graft occlusion, MACE, hemorrhage, postoperative delirium, and pulm, renal, and wound complications.

Pertussis (Whooping Cough)

Luiz Maracaja | Raj K. Modak

Risk

- Increasing prevalence 1976 (lowest) vs. 2012, 1010 vs. 41,880 cases (14 deaths in infants aged <12 mo).
- Substantial morbidity and mortality in USA children despite high childhood vaccination rates.
- Incidence highest for infants <1 y of age (23% of all cases).
- Adolescent group 10–19 y (33% of all cases).
- Incidence of death highest for infants <6 mo of age (91% of all deaths).
- Incidence greater among females than males (54%).
- Incidence greater among whites than minorities (90%).
- If unimmunized, 90% susceptibility following exposure to index case.
- Only 2% of adult population is protected against pertussis.
- Tdap vaccine coverage is 56% among adolescents and <6% among adults.

Perioperative Risks

- Most common complications occurring in those <6 mo of age: Hospitalization (69%), pneumonia (13%), seizures (2%), encephalopathy (<2%)
- Common complications in adults: Cough-related incontinence (28%), syncope (6%), pneumonia (5%), rib fractures (4%), hospitalization (3%)

Worry About

- Infectivity and contagion
- Secretions, pneumonia, altered mucociliary function, apnea, and decreased pulm reserves causing hypoxemia
- Postop complications related to coughing

Overview

- Pertussis is an acute respiratory infection caused by *Bordetella pertussis*.
- Transmission occurs by respiratory droplets with a 7-d to 10-d incubation period.
- Organism releases multiple toxins that damage the epithelial cells of the respiratory tract.
- Characterized by three phases: Catarrhal (cold symptoms), paroxysmal (cough symptoms), convalescence (persistent or episodic cough).
- Infectivity highest in catarrhal and early paroxysmal phases.
- Adolescents and adults display milder symptoms that may be indistinguishable from less serious causes of URI/LRI.
- Immunization in childhood has decreased but not eliminated incidence.
- Vaccine estimated 80–85% effective after three exposures, usually given as combination Tdap vaccine.
- Increased in incidence in adolescence (age 10–19), indicating a need for booster immunization.

- In October 2012, the ACIP recommended administration of Tdap during each pregnancy irrespective of the pt's prior history of immunization. Vaccinations given to pregnant women will stimulate the development of maternal antipertussis antibodies that will pass through the placenta, likely providing the newborn with protection against pertussis in early life protecting the mother from pertussis around the time of delivery, making her less likely to become infected and transmit pertussis to her infant. Optimal timing for Tdap administration is between 27–36 wk of gestation for maximal maternal antibody response and passive antibody transfer to the infant, although Tdap may be given at any time during pregnancy. However, the maternal antipertussis antibodies are short-lived.

Etiology

- *B. pertussis*, a fastidious gram-negative pleomorphic or rod bacillus.
- A whooping cough syndrome can also be caused by *Bordetella parapertussis*, *Chlamydia trachomatis*, and many adenoviruses.

Usual Treatment

- Infectivity and contagion control
- Most effective treatment occurs in the catarrhal and early paroxysmal phases.
- Macrolides (erythromycin, azithromycin, clarithromycin) and trimethoprim-sulfamethoxazole.
- Cough suppression: Dextromethorphan and codeine; expectorant: guaifenesin.
- Corticosteroids and β_2 agonists have an unclear role in the paroxysmal stage.
- In some cases hospitalization may be required to suppress cough, institute antibiotic treatment, monitor for apnea and hypoxemia, and provide general nutrition.
- Intensive care treatment may be needed for severe sequelae of pneumonia, seizures, and encephalopathy.
- Antibiotic therapy is not recommended in the convalescent phase.

Assessment Points

System	Effect	Assessment by Hx	PE	Test
HEENT	Upper airway obstruction	Difficulty feeding Difficulty breathing	Rhinorrhea Lacrimation Conjunctivitis	Nasal culture DFA
CV	High O_2 consumption	Irritability	Tachycardia	ECG
RESP	Cough V/Q mismatch Hypoxemia Pneumonia	Apnea, SOB Tachypnea, rales	Inspiratory whoop Cyanosis Rales	Culture and DFA Pulse oximetry, ABG CXR
GI	Poor oral intake Posttussive emesis Fatty liver Cough-induced hernias	Dehydration Inability to retain food Inguinal hernias	Altered turgor Weight loss Hepatomegaly Reducible hernias	Weigh on scale LFTs
RENAL	Hypovolemia	Oliguria	Altered turgor	BUN, Cr, FEN_a,
CNS	Seizures Encephalopathy	Seizure type Altered neuro logic status	Seizure type Neuro logic exam	EEG, CT, MRI LP, glucose, ammonia, BUN
ID		Immunization Hx Physical contacts		Culture and DFA

Key References: Centers for Disease Control and Prevention (CDC): National, state, and local area vaccination coverage among adolescents aged 13–17 years—United States, 2009, *MMWR Morb Mortal Wkly Rep* 59(32):1018–1023, 2010; Centers for Disease Control and Prevention (CDC): Updated recommendations for use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine (Tdap) in Pregnant women and persons who have or anticipate having close contact with an infant aged <12 months—Advisory Committee on Immunization Practices (ACIP), 2011, *MMWR Morb Mortal Wkly Rep* 60(41):1424–1426, 2011.

Perioperative Implications

Preoperative Preparation

- Postpone elective surgery until pt is noninfectious and symptom-free; uncomplicated disease resolves in 6–10 wk.
- Emergency surgery based on risks and benefits.
- Infectivity and contagion control with isolation precautions.
- Usage of disposable anesthesia circuit system.
- If possible, optimize respiratory function and nutrition prior to surgery.
- If in early phases, consider premedication with topical or oral decongestants (ephedrine, pseudoephedrine, xylometazoline) to reduce upper airway secretions; β_2 agonists (albuterol, metaproterenol) to minimize risk of bronchospasm.
- Optimize preop volume status to protect from dehydration.
- Premedication with respiratory depressants may increase risk of hypoxemia.

Monitoring

- Arterial cath may be useful in scenarios of impaired oxygenation or for frequent blood gas sampling.

Airway

- Acute and chronic coughing increase the risk of upper and lower airway edema with possible obstruction.
- Nasal and tracheal secretions increase the risk of laryngospasm and bronchospasm.
- Inspissated secretions can cause hypoxemia by mucous plugging and atelectasis, barotrauma by airway obstruction, and an inability to ventilate by ET due to obstruction.

Preinduction/Induction

- In some scenarios, RA may be favorable.
- Inhalational techniques with pungent agents should be avoided.
- Avoid agents associated with coughing.
- Usage of IV or topical lidocaine may decrease tracheal irritation and coughing.

Maintenance

- Keep pt warm and hydrated.
- Airway humidity should be controlled with a passive device to minimize humidity loss; or use an active humidifier that warms and humidifies the airway gases.
- Controlled ventilation allows optimal oxygenation and minimizes atelectasis.
- Consider PEEP for alveolar recruitment.
- Be prepared to contend with airway secretions and suction the ETT as needed; saline-moistened secretions are more readily removed.

Extubation

- Oral and tracheal suctioning should be performed with anticipation of copious secretions.
- Consider the use of preemergence bronchodilator treatment to minimize bronchospasm.
- Emergence techniques using NO may carry an increased risk of postextubation hypoxemia.
- An H_2 blocker should be considered with postop N/V prophylaxis to minimize risk of aspiration of acidic gastric contents.

Postoperative Period

- Control of infectivity and contagion with isolation precautions should be maintained.
- Supplemental O_2 therapy should include the use of a humidifier.
- Aggressive pulm toilet.
- Monitoring for apnea and hypoxia is needed.
- Regional techniques for pain management may be useful in avoiding serious respiratory complications related to IV analgesics.

Anticipated Problems/Concerns

- All contacts—including family, other pts, and hospital personnel—are at risk for infection.
- High risk of respiratory insufficiency due to hypoxemia from tissue damage, edema, and secretions.
- Infants at higher risk than adults for sequelae and death.