Perioperative Implications

Preoperative Preparation
- Correct fluid and acid-base deficits.
- Place orogastric tube to aspirate contents.
- Pyloric stenosis is not a surgical emergency.

Monitoring
- Routine

Airway
- Full stomach

Preinduction/Induction
- IV atropine 0.02 mg/kg; minimal dose 0.1 mg.
- Empty stomach with orogastric tube or suction cath.
- Consider awake intubation or IV RSI, especially if pt received barium contrast.
- Modified RSI with either propofol alone or propofol and nondepolarizing muscle relaxant; cricoid pressure and mask ventilation have been used successfully without increased incidence of complications.
- Hypoxemia is common during rapid-sequence induction; ventilate with cricoid pressure.
- In a properly resuscitated pt with recent loss of IV access, inhalational induction has been used successfully and can be considered a safe alternative.

Maintenance
- No technique is absolutely contraindicated by pyloric stenosis alone.
- Inhalational agent in O_2 and air or N_2O, short or intermediate-acting muscle relaxant.
- Avoid opioids.
- Local infiltration with bupivacaine or ropivacaine by surgeon.
- IV fluids should be warmed.
- Replacement fluids: LR 1–2 mL/kg per h.
- May consider using D_5 if the procedure lasts more than 1 h.

Extubation
- Potential of full stomach; suction stomach prior to extubation.
- Reverse NMB agent.
- Awake extubation
- Delayed awakening is common

Adjuvants
- Consider potential of associated liver and GU abnormality.

Postoperative Period
- Potential for central apnea and reactive hypoglycemia
- Pulse oximetry/apnea monitoring for the first 12–24 h
- Continue IV glucose until there is adequate PO intake.
- Pain score: 2–5, acetaminophen is usually sufficient; avoid opioids.

Anticipated Problems/Concerns
- Potential for full stomach.
- Need to correct fluid and/or electrolyte imbalances preop.
- Delayed awakening is common.

Q Fever

Thomas A. Russo | Paul R. Knight III

Risk
- Greatest after direct or indirect exposure to infected cattle, sheep, or goats; particularly at parturition
- Less from a variety of other animals, rarely from blood products
- Abattoir workers, veterinarians, and other animal workers at greatest risk
- Pts with immune impairment are at a higher risk (e.g., HIV, steroids)
- Mortality 2.4% overall; chronic infection ~16%.

Perioperative Risks
- Decreased respiratory reserve secondary to pneumonia
- Decreased myocardial reserve secondary to endocarditis
- Further increase in hepatocellular injury if there is liver involvement

Worry About
- Secondary respiratory complications
- Decreased myocardial performance and emboli with endocarditis
- Hepatic or neurologic involvement

Overview
- Acute infection: Asymptomatic (~50%) to moderate severity (2% hospitalized).
- Acute symptomatic disease presents as nonspecific febrile syndrome ± pneumonitis (~50%), hepatitis (80% or more), pericarditis and/or myocarditis (<5%), neurologic disease (<5%).
- Chronic disease occurs in <1% of infections, usually without fever.
- Chronic disease, primarily endocarditis (particularly abn or prosthetic valves) and occasionally bone.

Etiology
- *Coxiella burnetii*, the causative organism, is a fastidious obligate intracellular bacterium.
- The spore stage can withstand harsh environmental conditions for prolonged periods, facilitating indirect transmission.
- Highly infectious; transmitted (1–10 organisms) primarily by inhalation, from unpasteurized milk, or by a tick bite.
- Incubation period ~20 d (range, 3–40 d).
- Bacterium targets reticuloendothelial cells and develops into granuloma.

Usual Treatment
- Dx: Epidemiologic circumstance and serology (positive in 2–4 wk).
- Acute disease: Doxycycline or quinolones for 2–3 wk hastens resolution.
- Chronic disease: Doxycycline and rifampin for 1–3 y; with endocarditis, possible valve replacement.

Assessment Points

System	Effect	Assessment by Hx	PE	Test
CV	Endocarditis Immune complex vasculitis Microthromboembolism	Rash, reduced exercise tolerance	Clubbing, rash, murmurs, petechiae	ECHO, ECG, culture negative with standard techniques serology, PCR
RESP	Atypical pneumonia, asymptomatic pneumonia, rapidly progressive pneumonia, interstitial pulm fibrosis	Pleuritic chest pain, cough, dyspnea	Consolidation, rales, pleural effusions	CXR, serology
GI	Acute hepatitis	N/V, fatigue, diarrhea, sweats and chills	Hepatomegaly or hepatosplenomegaly	SGOT, SGPT, bilirubin, granulomas on liver biopsy
HEME	Hyperglobulinemia, anemia, thrombocytosis/thrombocytopenia	Easy fatigue, bleeding tendency	Pallor; purpuric eruptions	Sedimentation rate, Hct/Hgb, plt count
OB	Immune complex vasculitis Q fever complications secondary to reactivation of infection during pregnancy	Spontaneous abortion more likely		Microscopic hematuria Isolation of *C. burnetii* from placenta
CNS	Meningoencephalitis Optic neuritis	Weakness, seizures, meningismus, blurred vision, headache	Focal deficits, sensory loss	Increased monocytes and protein in CSF; normal glucose
MS	Immune complex vasculitis, vertebral osteomyelitis	Myalgia	Point tenderness	X-ray

Key References: Marrie TJ: *Coxiella burnetii* (Q fever). In Mandell GL, Bennett JE, Dolin R, editors: *Mandell, Douglas, and Bennett's principles and practice of infectious diseases*, ed 5, New York, NY, 2000, Churchill Livingstone, pp 2043–2050; Schaik EJ, Chen C, Mertens K, et al.: Molecular pathogenesis of the obligate intracellular bacterium *Coxiella burnetii*, *Nat Rev Microbiol* 11(8):561–573, 2013; Eldin C, Melenotte C, Mediannikov O, et al.: From Q fever to *Coxiella burnetii* infection: a paradigm change, *Clin Microbiol Rev* 30:115–190, 2016.

Perioperative Implications

Preoperative Preparation
- Continue or initiate antibiotic therapy and optimize any organ system dysfunction.
- Only emergency surgery should be performed.
- Assess respiratory and cardiac reserve and hepatic and neurologic status.
- Careful monitoring.
- Arterial line may be necessary if pneumonia present.
- Myocardial valvular disease secondary to chronic Q fever may require a PA line or other invasive hemodynamic monitors.
- Increased arterial line complications due to vasculitis (rare).

Airway
- None

Induction
- Pneumonia may cause rapid desaturation.
- Hypotension and CV instability if there is cardiac valvular injury.

Maintenance
- With acute hepatitis, avoid drugs that require hepatic metabolism or decrease blood flow to the liver.

Extubation
- Resp status and CV stability must be considered.

Adjuvants
- Depends on hepatic or renal impairment.

Postoperative Period
- Monitor respiratory and/or myocardial status carefully; ICU monitoring may be required.
- Liver enzymes should be followed if there is hepatic involvement.

Anticipated Problems/Concerns
- Pts who require emergency surgery and present with an acute infection might need extended antibiotic therapy to prevent persistent *C. burnetii* infection.

Raynaud Phenomenon

Veena Graff

Risk
- Prevelance: 3-5% of population (based on population-based surveys of various ethnicities)
- Five times more prominent in women than men; commonly diagnosed in second, third, and fourth decades of life.

Perioperative Risks
- Rare morbidity of ischemia, resulting in necrosis and gangrene

Worry About
- Associated systemic disorders
- Arterial thrombosis secondary to prolonged vasospasm and/or ischemic attacks, which can lead to ulcerations and/or gangrene in affected areas
- Hypothermia causing RP attacks (i.e., secondary to cold operating rooms, lack of pt warming, emotional stress)

Overview
- Primary RP, also known as Raynaud disease: No association with systemic diseases.
- Secondary RP: Systemic associations with connective tissue disorders (most common), drugs/toxins, endocrine disorders, hematologic disorders, or cancers.
- Abnormal sensitivity of small arteries and arterioles to vasoconstrictive stimuli.
- RP attacks typically triggered by cold and/or stress and often manifest in a bilateral symmetric pattern (commonly fingertips/toes).
- Triphasic color pattern in affected areas: Pallor due to vasoconstriction (white), followed by cyanosis (blue), followed by erythema and edema (red) due to vasodilation.

Etiology
- Etiology unclear; however, likely hypotheses include:
  - Loss of nerve fibers supplying the endothelium, which normally releases vasodilating chemicals such as nitric oxide, causing vasoconstriction
  - Hyperhomocysteinemia
  - Role of angiotensin II and serotonin in increasing endothelial smooth muscle proliferation

Usual Treatment
- Noninvasive preventive measures; avoid prolonged exposure to cold, dress warmly, and do not smoke.
- Pharmacotherapies: Calcium-channel antagonists and avoidance of vasoconstrictors.

Assessment Points

System	Effect	Assessment by Hx	PE	Test
HEENT	Impaired joint mobility due to associated disorders such as scleroderma	Inability to open mouth due to limited TMJ mobility	Thorough airway assessment (neck ROM and mouth opening)	
RESP	Associated with primary pulm Htn	Chest discomfort Weakness	JVD Pulmonic ejection click	CXR, right cardiomegaly, dilated pulm artery ECG, right atrial enlargement
VASC	Small arterial occlusion	Often associated with numbness, tingling, and pain	Triphasic color pattern in affected areas: Pallor, then cyanosis, then erythema	

Key References: Wigley FM: Clinical practice. Raynaud's phenomenon, *N Engl J Med* 347(13):1001–1008, 2002; Liang YX, Gu MN, Wang SD, et al.: Perianesthesia management of Raynaud's phenomenon—a case report, *J Perianesth Nurs* 25(4):221–225, 2010.

Perioperative Implications

Preoperative Preparation
- Assess for coexisting systemic diseases.
- Potential for difficult airway; thorough airway assessment required (reduced TMJ mobility if associated with scleroderma).

Monitoring
- Standard ASA monitors.
- Can obtain ABG to assess oxygenation if unable to assess pulse oximeter readings.
- Assess risk/benefit ratio if considering arterial cannulation because of danger of arterial vasospasm.

Induction
- General or regional anesthetic options are acceptable.
- Balanced anesthetic with both types to avoid extreme fluctuations in BP.

Maintenance
- Avoid fluctuations in BP.
- Ensure pt warming.
- Use of tourniquet controversial.

Adjuvants
- Avoid vasoconstrictors if possible to avoid RP attacks.

Postoperative Period
- Ensure pt warming.
- Check pulses in all extremities.