

**Perioperative Implications****Preoperative Preparation**

- Desired hemodynamics: Preload, normal (CVP 10-12 mm Hg); afterload, low; PVR, normal; HR, normal to high; contractility, normal
- Liberal oral fluids preop
- Avoid premedication causing hypoventilation
- Subacute bacterial endocarditis prophylaxis

**Monitoring**

- Absolute air bubble precaution
- Arterial cath
- CVP cath; know specific anatomy, incl SVC variations
- TEE
- Others as per ASA routine

**Airway**

- Associated congenital syndromes with airway anomalies
- Cricoid ring limiting airway diameter
- Primary need to maintain airway and avoid increased PaCO<sub>2</sub>
- PEEP, with pulm edema or elevated pulm blood flow

**Induction**

- If IV in place, use fentanyl or ketamine with pancuronium, vecuronium, or rocuronium.
- If no IV:
  - If unstable, ketamine IM.
  - If stable, slow inhalational induction with sevoflurane (avoid high sevoflurane levels until IV placed).
- Actively avoid hypoventilation and agents that produce myocardial depression.

**Maintenance**

- Use fluids judiciously to avoid RV overload.
- Positive pressure ventilation usually improves oxygenation.
- Use narcotics in conjunction with inhalational agents as tolerated.
- Avoid nitrous oxide.
- Use high FiO<sub>2</sub>
- Capnographic ET/CO<sub>2</sub> will not accurately reflect PaCO<sub>2</sub>
- Prepare for hypothermic cardiac arrest during TAPVR repair.
- Avoid hypothermia before and after bypass.

**Extubation**

- Do not attempt deep or early extubation.
- Before extubation, assess adequacy of ventilation (with insp pressures of at least -20 mm Hg) and tidal volumes.

**Postoperative Period**

- Close monitoring of ventilation and pulse oximetry.
- Active warming with avoidance of shivering.
- Be prepared for immediate reintubation.

**Adjuvants**

- Inotropic support with dopamine or epinephrine

**Anticipated Problems/Concerns**

- If pulm hypertensive crisis occurs:
  - Hyperventilate.
  - 100% inspired O<sub>2</sub>
  - Consider iloprost, prostaglandin E<sub>1</sub>, tolazoline, amrinone, isoproterenol, or nitric oxide.

## Anorexia Nervosa

Russell T. Wall III

**Risk**

- Primarily in white adolescent females from middle- or upper-class families; 4% to 10% males.
- More common in models, ballet students, and professions demanding high achievement.
- Occurs in 5-10 per 100,000 population; mortality rate 5-10%.
- Bimodal peak age of onset: 14 and 18 y.

**Perioperative Risks**

- Predisposing conditions include:
  - CV dysfunction (bradycardia, hypotension, and dysrhythmias).
  - Acid-base abnormalities (both metabolic acidosis and alkalosis are possible), lyte abnormalities (decreased K, Mg, NA, and P)
  - Hematologic abnormalities (decreased Hgb, WBC, fibrinogen, and plt).
  - Hypothermia, delayed gastric emptying, and renal dysfunction (prerenal azotemia).
- Lyte/nutrient abnormalities associated with refeeding: most dangerous is hypophosphatasia (but also thiamine deficiency and decreased K, Mg, NA, and P).

**Worry About**

- Degree and duration of malnutrition (excess protein depletion = impaired cellular function)

- Degree of organ dysfunction
- Greater weight loss = greater risk
- Refeeding syndrome (severe hypophosphatasia occurred in 0.5% in largest modern study)

**Overview**

- Anorexia nervosa
  - Obsessive fear of obesity; pursuit of thinness
  - Dramatic decrease in food intake and excessive physical activity
  - Refusal to maintain weight above 85% IBW
  - Distorted body image
  - Amenorrhea for >3 mo
  - Radical restriction of caloric intake
  - Appears cachectic
  - Risk of death high if weight loss >40% of IBW
  - Of patients, 40% to 50% recover with treatment; 20% to 30% improve with treatment
- Bulimia
  - Means "ox hunger" or voracious appetite
  - Obsessive fear of obesity; overconcern with body shape and weight
  - Appears well nourished
  - Averages two binge-eating episodes each wk for at least 3 mo
  - Irresistible urge to overeat; loss of control in desire to eat

- Wt control by self-induced vomiting, diuretic and laxative use, strict dieting/fasting, vigorous exercise
- Greater percent of alcohol use, illicit drug use, stealing, self-mutilation, and suicide attempts than with anorexia
- Of patients, 30% to 60% recover with treatment

**Etiology**

- Unknown, but possibly hypothalamic dysfunction or psychiatric cause

**Usual Treatment**

- No specific/definitive treatment
- Therapies offered:
  - Psychotherapy (individual, group, and family)
  - Behavior modification
  - Antidepressants (TCAs, MAO inhibitors, serotonin-uptake inhibitors) often prescribed but not consistently effective
  - Nutrition counseling (1500 to 2500 calories/d, metoclopramide or bethanechol for gastric emptying, benzodiazepine before meals)
  - Relaxation exercises
- If severe: Hospitalization stressing weight gain, with tube feedings or hyperalimentation as last resort

| Assessment Points |  |  |  |  |
|-------------------|--|--|--|--|
| System            | Effect   | Assessment by Hx   | PE   | Test   |
| CV                | Decreased response to SNS<br>Hypovolemia   |  | Bradycardia<br>Orthostatic hypotension<br>Hypotension (<70 mm Hg systolic)   | EKG  |
|                   | LV dysfunction (myocardial atrophy)<br>Decreased LV wall thickness<br>Decreased LV cavity size<br>Decreased myocardial contractility<br>MV prolapse<br>Cardiomyopathy secondary to ipecac<br>Conduction abnormalities                              | CHF symptoms   | CHF<br><br>Murmur  | CXR<br>ECHO  |
|                   | Hypercholesterolemia<br>Anemia<br>Thrombocytopenia<br>Hypofibrinogenemia   |  | Dysrhythmias (tachydysrhythmia, AV blocks, nonspecific ST-T changes, low QRS amplitude, sinus bradycardia, prolonged QT) | EKG<br><br>Cholesterol, triglycerides<br>Hct<br>Plts<br>Fibrinogen   |
| RESP              | Aspiration pneumonia<br>Resp insufficiency   | Vomiting with decreased consciousness<br>Dyspnea<br>Muscle weakness  | Hypoxia, tachypnea<br>Bradypnea (<15/min)  | CXR<br><br>Decreased P   |
| GI                | Delayed gastric emptying, decreased motility<br>Esophagitis, esophageal/gastric rupture<br>Hepatic insufficiency   | Early satiety, abdominal pain<br>Vomiting with bulimia   | Pneumomediastinum<br>Pneumoperitoneum<br>Fatty infiltration of liver   | CXR<br>Abdominal x-rays<br>Increased LFTs  |
| RENAL             | Prerenal azotemia secondary to decreased volume<br><br>Renal insufficiency<br>Renal calculi<br>Polyuria<br>Acid-base abnormalities (metabolic acidosis/alkalosis)<br>Lyte abnormalities (decreased K, Na, Mg, CA, and P)<br>Hypoalbuminemia<br>ATN | Starvation<br>Dehydration, vomiting<br>Decreased GFR<br><br>XS caffeine and water ingestion<br>Vomiting<br>Diuretics, laxative abuse<br>Rhabdomyolysis | <br><br><br><br><br><br>Peripheral edema   | BUN 60–70 mg/dL<br>Lytes (K, Na, P, Mg)<br>Serum creatinine<br><br>ABGs<br>Lytes<br><3 g/dL is evidence of severe protein malnutrition<br>CPK, LDH, aldolase |
| ENDO              | Decreased BMR<br>Hypothermia (<36.6° F rectally)<br>Estrogen deficiency<br>Depressed immune function<br><br>Hypophosphatemia<br>Hypomagnesemia<br>Hypoglycemia<br><br>Euthyroid sick syndrome  | <br><br>Amenorrhea   | Vasoconstriction<br><br><br><br><br>Bradycardia<br>Hypothermia<br>Cold intolerance<br>Dry skin and hair<br>Slow DTRs     | <br><br>Decreased WBC (leukopenia)<br><br><br>Serum P<br>Serum Mg<br>Serum glucose<br>TFTs   |
| CNS               | Brain atrophy with dilated ventricles<br>Risk for Wernicke/Korsakoff if refeed without thiamine treatment<br>Depression  | Starvation<br>Illicit drug and alcohol use   |  |  |
| PNS               | Peripheral neuropathy  |  |  | EMG changes  |
| MS                | Osteoporosis<br><br>Cachexia (if anorexic)<br>Myopathy   | Estrogen and IGF-I deficiency<br><br>Dieting   | Vertebral compression fractures<br>Stress fractures  | X-rays of back and extremities   |

**Key References:** Helgeson LE: Obesity and nutritional disorders. In Fleisher LA, editor: *Anesthesia and uncommon diseases*, ed 5, Philadelphia, 2006, Saunders, pp 216–218; Rubin RT: Anorexia nervosa, bulimia nervosa, and other eating disorders. In DeGroot LJ, Jameson JL, editors: *Endocrinology*, ed 5, Philadelphia, 2006, Saunders, pp 877–886.

### Perioperative Implications

#### Preoperative Preparation

- Evaluate degree and duration of malnutrition.
- Assess degree of organ damage (especially cardiac, pulm, renal, and hepatic).
- For emergency surgery, severely malnourished pts have significantly increased morbidity and/or mortality.
  - Delay elective surgery until pt is medically stable and nutritional status is improved.
  - Optimize hemodynamics, volume status, acid-base status, lytes (Na, K, P, and Mg), and glucose.
- Treat severe anemia if present.
- Consider metoclopramide to promote gastric emptying.

#### Monitoring

- ABGs, lytes.
- A-line, CVP, and PA cath may be indicated.

#### Airway

- Induction
  - Consider rapid-sequence induction (decreased GE sphincter tone and gastric emptying)
  - Cautious dosing because of possible LV dysfunction and hypovolemia
  - Antibiotics

#### Maintenance

- Aggressively avoid hypothermia.
- Cautious use of potent inhalation agents to avoid hemodynamic depression.
- Excess fluids may precipitate pulm edema and CHF.

#### Extubation

- Consider awake extubation.

#### Adjuvants

- Cautious use of muscle relaxants (decreased muscle mass, lyte and acid-base abnormalities)

### Anticipated Problems/Concerns

- Temperature control
- Hemodynamic stability
- Acid-base and lyte management
- Whether pt's metabolic reserve is adequate to accommodate intraop and postop surgical stress and/or demands of wound healing and combating infection