Induction
- Watch for hypotension due to volume depletion from prep and/or decreased systolic function from cardiotoxic chemotherapeutic agents.

Maintenance
- Avoid high concentrations of O_2 in pulm fibrosis.
- Goal-directed fluid therapy (based on euvolemia and pulsus paradoxus).
- Avoid N_2O (bowel surgery).
- Maximize efforts to prevent hypothermia.

Postoperative Considerations
- Consider overnight ventilation if procedure is long, and prepare for significant blood loss/fluid resuscitation. An epidural catheter can optimize pulmonary toilet and recovery.
- Fluids shifts occur during first 48 h.
- Early oral nutrition, ambulation, and drain removal.
- EBT of TURBT about 200 mL; cystectomy between 500–1000 mL.
- Pain score of 7–9 (cystectomy) expected.

Acknowledgement

I wish to thank Dr. Andrew Dziewit for his work on this chapter in an earlier edition of this book.

Cancer, Breast

Vincent S. Cowell

Risk
- 100 times more common in women than men.
- Besides skin cancer, most common cancer in USA for women; 1 in 8 women develop breast cancer; a man's lifetime risk is about 1 in 1000.
- Most significant risk factors for breast cancer are gender and growing older. About 2 out of 3 women with invasive breast cancer are 50 y or older when the cancer is found.
- Racial predilection: non-Hispanic whites > African Americans > Asians, Hispanics, and Native Americans.
- African Americans are more likely to die of breast cancer because their cancers tend to be more aggressive and of a more advanced stage that is diagnosed at a younger age.
- Of breast cancers, 5–10% are directly due to inherited mutations of the *BRCA1* and *BRCA2* gene, which tend to occur more often in younger women.
- Increased with family Hx among close blood relatives; personal Hx increases the risk of developing a new cancer in the same or other breast.
- >85% are diagnosed in women with no family Hx (genetic mutations secondary to aging and life in general rather than inherited).
- Associated with increased risk: Obesity, aging, high alcohol consumption, estrogen exposure, and long-term heavy smoking.

Perioperative Risks
- Mortality: very rare
- Lymphedema of arm following axillary node dissection
- Ipsilateral brachial plexus injury from extensive abduction of the arm, or iatrogenic
- Injury to long thoracic and/or thoracodorsal n. during surgical dissection of axilla
- Rare incidence of unrecognized pneumothorax
- Breast surgery is associated with postop N/V, with incidence as high as 60%
- Neuropathic pain, postmastectomy pain syndrome (up to 20–30% may develop symptoms)

Worry About
- Systemic or regional effect of metastasis to lungs, brain, or bones.
- High incidence of postop N/V
- NMB and identification of major nerves.
- Access to an upper extremity may be restricted or limited
- Potential adverse effects of chemotherapeutic drugs and chest radiation therapy

Overview
- Two types of invasive breast cancer, which account for 95%: invasive ductal carcinoma at around 80% and invasive lobar carcinoma at around 10%.
- Abnormal growth of adenomatous tissue that results in systemic symptoms and metastasizes to the liver, bones, lungs, and brain.
- Early detection of breast cancer offers a greater range of treatment options, increasing survival time.
- Mammography: reduces the risk of dying from breast cancer by 15–20%
- Physical exam and mammography are complementary
- Needle biopsies provide histologic diagnosis.
- Presurgical needle localization may be necessary for nonpalpable lesions.
- Most breast biopsies yield benign diagnosis.

Etiology
- Exact cause of most breast cancers is still unknown.
- Inherited and acquired genetic mutations increase the risk of developing breast cancer.

Usual Treatment
- Noninvasive breast cancer: Lumpectomy or partial mastectomy rarely with sentinel node Bx and/or axillary node dissection with radiation and/or hormonal therapy (e.g., tamoxifen and toremifene)
- Invasive breast cancer: Lumpectomy, partial mastectomy with sentinel lymph node Bx, possible ALND or radiation, possible chemotherapy, and possible hormonal therapy
- Radical mastectomy: Rarely performed
- Of women who undergo mastectomy, 20–40% elect to have breast reconstruction, with either an implant, a tissue flap, or a combination of the two.

Prognosis
- In USA, about 40,730 women will die from breast cancer in the year 2015, making it the second-most lethal cancer in women (lung cancer is the leading cancer killer in women).
- Relative 5-y survival rate for women diagnosed with cancer is 89%. The 10-y survival rate is about 83%; after 15 years, it is 78%. Unfortunately, women in lower social and economic groups still have significantly lower survival rates than women in higher groups.

Assessment Points

System	Effect	Assessment by Hx	PE	Test
CHEST	Lung lesions	Nipple discharge Chest pain or discomfort	Breast asymmetry Nipple discharge, erythema, crusting, or erosion Nipple retraction Skin dimpling	Physical exam Mammography Fine-needle aspiration biopsy CXR
GI	Liver metastasis	Fatigue, abdominal pain	Enlarged or nodular liver	Liver US or CT scan
HEME	Bone metastasis	Lethargy, SOB	Anemia, pancytopenia	CBC
CNS	Brain metastasis	Change in mental status, seizures	Neurologic exam	Head CT
MS	Bone metastasis Pathologic fractures	Severe pain Immobility Arm swelling	Deformities Pain on palpation Axillary adenopathy	Bone scan X-rays Physical exam

Key References: Andreae MH, Andreae DA: Regional anaesthesia to prevent chronic pain after surgery: a Cochrane systematic review and meta-analysis, *Br J Anaesth* 111(5):711–720, 2013; Wu J, Buggy D, Fleischmann E, et al: Thoracic paravertebral regional anesthesia improves analgesia after breast cancer surgery: a randomized controlled multicentre clinical trial, *Can J Anaesth* 62(3):241–251, 2015.

Perioperative Implications

Preoperative Preparation
- Optimal preop preparation, in response to associated anxiety, which can be achieved through both pharmacologic and nonpharmacologic means

Monitoring
- Routine with attention to placement of ECG leads
- IV site and BP cuff on contralateral arm

Airway
- Table arrangements may warrant a secure airway.
- Nasal O_2 or LMA may be appropriate.

Induction
- Thoracic epidurals, intercostal nerve blocks, and local infiltration have successfully been administered as primary anesthetics and adjuvants to GA.
- There is speculation that regional anesthesia and analgesia techniques might help to maintain perioperative immune competence thus modulating the risk of recurrence or metastasis.

Maintenance
- Consideration for the high incidence of postop N/V.
- Incision over operative breast that can also include axilla.
- Dissection can include breast areolar tissue, muscle down to chest wall, and extension into axilla.
- Identification of thoracodorsal and long thoracic nerve often requires stimulation that contraindicates presence of NM blocking agents.
- Surgical field will be in view and allow for monitoring of active blood loss.
- Surgical team leaning on chest can affect ventilatory performance.

Postoperative Considerations
- Pain score: 2–6.
- Pain adequately managed with Toradol, acetaminophen, narcotic PCA, or regional block.
- Communicate with PACU that no venous sticks or BP measurements should be performed on arm of operative side when axillary lymph node dissection is involved.

Anticipated Problems/Concerns
- Anxiety associated with the fear of breast cancer and altered body image can be quite significant.

Cancer, Esophageal

Dawn P. Desiderio | Alessia Pedoto

Risk
- Incidence in USA: 4.39:100,000 in white men, 2.0:100,000 in white women, 8.63/100,000 in African-American men, and 4.2:100,000 in black women.
- Adenocarcinoma more common in white men, while SCC highest in black men.
- Overall mortality rate is 4% (white) to 8% (black).

Perioperative Risks
- Reflux as a risk of aspiration.
- Malnutrition with dehydration due to dysphagia.
- Periop arrhythmias occur in 20–60% of cases.
- Anastomotic leak most frequent surgical complication (9–10%).

Worry About
- Pulm compromise (25%) due to lung injury from preop chemo-/radiation therapy, chronic aspiration, extensive tobacco use, and ventilator-induced lung injury
- Airway protection during induction and postop
- Arrhythmia
- Alcohol withdrawal syndrome
- Hydration status/malnutrition

Overview
- Primarily either SCC from the esophageal squamous epithelium or adenocarcinoma of gastric origin.
- Median age of diagnosis is 67 y, with a long-standing Hx of tobacco and alcohol intake.
- Dysphagia and weight loss are initial symptoms, often present for 3–4 mo.
- Extensive local growth and lymphatic involvement before becoming widely disseminated.

Etiology
- SCC (mainly localized in the upper one-third of the esophagus) is associated with achalasia for >25 y, tobacco use, alcohol, and lack of aspirin and statin use.
- Adenocarcinoma (mainly at GE junction) is associated with GERD, esophagitis (Barrett esophagus), and obesity.
- Nutritional factors (red meat, poor vegetable intake, hot liquids) have been implicated.

Usual Treatment
- Treatment depends on extent of disease and pt's medical status.
- Radioablation or photodynamic therapy is reserved for esophageal dysplasia.
- Surgery with or without chemotherapy the only curative option (open or minimally invasive [MIS]).
- Radiation is reserved for pts with unacceptable surgical risks or advanced disease.
- Palliative placement of internal esophageal stents facilitates swallowing of liquids and secretions.

Assessment Points

System	Effect	Assessment by Hx	PE	Test
CV	Alcohol abuse–induced cardiomyopathy and arrhythmias	DOE Exercise tolerance		ECG ECHO, stress test
RESP	Tobacco abuse Chronic aspiration Radiation/chemotherapy	Pneumonias, RV Htn Cough, DOE Sputum	Wheezing RV heave	CXR PFTs, DL_{CO} ABG
GI	Obstruction Reflux Malnutrition	Dyspnea, orthopnea, weight loss	Debilitated	EGD
CNS	Alcohol abuse Delirium tremens	Last EOTH ingestion and amount		
MS	Weakness	Poor nutrition	Muscle wasting	Serum albumin
RENAL	Dehydration	Limited intake		Lytes, Cr, BUN

Key References: Ng JM, Carney A: Anesthesia for esophagectomy, *Anesthesiol Clin* 33:143–163, 2015; Carney A, Dickinson M: Anesthesia for esophagectomy, *Anesthesiology Clin* 33:143–163, 2015.

Perioperative Implications

Preoperative Preparation
- Sedation should be minimized to prevent aspiration in pts at risk.
- Antisialagogue (atropine 0.4 mg or glycopyrrolate 0.2 mg) may be used.
- May premedicate with H_2 blockers for acid aspiration prophylaxis plus metoclopramide to promote gastric emptying.
- Steroids given if recently used.
- Placement of thoracic epidural or paravertebral cath for postop pain control.
- Gabapentinoids to prevent chronic pain.
- Cisplatinum-based chemo can lead to CRF.
- Fasting for 6-8 h for solids and 2 h for carbohydrate-rich drinks has been suggested (ERAS) if no dysphagia.

Monitoring
- Monitor arterial line for ABG and BP.
- Employ goal-directed therapy techniques for fluid management.