

TABLE 9-6 RISK MODIFICATION TO REDUCE PERIOPERATIVE PULMONARY COMPLICATIONS**Preoperatively**

- Cessation of smoking for at least 8 weeks before and until at least 10 days after surgery
- Training in proper lung expansion techniques
- Inhalation bronchodilator and/or steroid therapy, when indicated
- Control of infection and secretion, when indicated
- Weight reduction, when appropriate

Intraoperatively

- Limited duration of anesthesia
- Avoidance of long-acting neuromuscular blocking drugs, when indicated
- Prevention of aspiration and maintenance of optimal bronchodilation

Postoperatively

- Optimization of inspiratory capacity maneuvers, with attention to:
 - Mobilization of secretions
 - Early ambulation
 - Encouragement of coughing
 - Selective use of a nasogastric tube
- Adequate pain control without excessive narcotics

Source: From VA Lawrence et al: *Ann Intern Med* 144:596, 2006, and WF Dunn, PD Scanlon: *Mayo Clin Proc* 68:371, 1993.

should be considered to be at elevated risk for postoperative pulmonary complications.

3. Patients at higher risk of pulmonary complications should undergo incentive spirometry, deep-breathing exercises, cough encouragement, postural drainage, percussion and vibration, suctioning and ambulation, intermittent positive-pressure breathing, continuous positive airway pressure, and selective use of a nasogastric tube for postoperative nausea, vomiting, or symptomatic abdominal distention to reduce postoperative risk (**Table 9-6**).
4. Routine preoperative spirometry and chest radiography should not be used routinely for predicting risk of postoperative pulmonary complications but may be appropriate for patients with chronic obstructive pulmonary disease or asthma.
5. Spirometry is of value before lung resection in determining candidacy for coronary artery bypass; however, it does not provide a spirometric threshold for extrathoracic surgery below which the risks of surgery are unacceptable.
6. Pulmonary artery catheterization, administration of total parenteral nutrition (as opposed to no supplementation), or total enteral nutrition has no benefit in reducing postoperative pulmonary complications.

PERIOPERATIVE MANAGEMENT AND PROPHYLAXIS**DIABETES MELLITUS**

(**See also Chaps. 417–419**) Many patients with diabetes mellitus have significant symptomatic or asymptomatic CAD and may have silent myocardial ischemia due to autonomic dysfunction. Evidence supports intensive perioperative glycemic control to achieve near-normal glucose levels (90–110 mg/dL) rather than moderate glycemic control (120–200 mg/dL), using insulin infusion. This practice must be balanced against the risk of hypoglycemic complications. Oral hypoglycemic agonists should not be given on the morning of surgery. Perioperative hyperglycemia should be treated with IV infusion of short-acting insulin or SC sliding-scale insulin. Patients whose diabetes is diet controlled may proceed to surgery with close postoperative monitoring.

INFECTIVE ENDOCARDITIS

(**See also Chap. 155**) Perioperative prophylactic antibiotics should be administered to patients with congenital or valvular heart disease, prosthetic valves, mitral valve prolapse, or other cardiac abnormalities, in accordance with ACC/AHA practice guidelines.

VENOUS THROMBOEMBOLISM

(**See also Chap. 300**) Perioperative prophylaxis of venous thromboembolism should follow established guidelines of the American College of Chest Physicians. Aspirin is not supported as a single agent for thromboprophylaxis. Low-dose unfractionated heparin (≤ 5000 units SC bid), low-molecular weight heparin (e.g., enoxaparin, 30 mg bid or 40 mg qd), or a pentasaccharide (fondaparinux, 2.5 mg qd) is appropriate for patients at moderate risk; unfractionated heparin (5000 units SC tid) is appropriate for patients at high risk. Graduated compression stockings and pneumatic compression devices are useful supplements to anticoagulant therapy.

10 Palliative and End-of-Life Care

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EPIDEMIOLOGY

In 2010, according to the Centers for Disease Control and Prevention, 2,468,435 individuals died in the United States (**Table 10-1**). Approximately 73% of all deaths occur in those >65 years of age. The epidemiology of mortality is similar in most developed countries; cardiovascular diseases and cancer are the predominant causes of death, a marked change since 1900, when heart disease caused $\sim 8\%$ of all deaths and cancer accounted for $<4\%$ of all deaths. In 2010, the year with the most recent available data, AIDS did not rank among the top 15 causes of death, causing just 8369 deaths. Even among people age 35–44, heart disease, cancer, chronic liver disease, and accidents all cause more deaths than AIDS.

It is estimated that in developed countries $\sim 70\%$ of all deaths are preceded by a disease or condition, making it reasonable to plan for dying in the foreseeable future. Cancer has served as the paradigm for terminal care, but it is not the only type of illness with a recognizable and predictable terminal phase. Because heart failure, chronic obstructive pulmonary disease (COPD), chronic liver failure, dementia, and many other conditions have recognizable terminal phases, a systematic approach to end-of-life care should be part of all medical specialties. Many patients with illness-related suffering also can benefit from palliative care regardless of prognosis. Ideally, palliative care should be considered part of comprehensive care for all patients. Palliative care can be improved by coordination between caregivers, doctors, and patients for advance care planning, as well as dedicated teams of physicians, nurses, and other providers.

The rapid increases in life expectancy in developed countries over the last century have been accompanied by new difficulties facing individuals, families, and society as a whole in addressing the needs of an aging population. These challenges include both more complicated conditions and technologies to address them at the end of life. The development of technologies that can prolong life without restoring full health has led many Americans to seek out alternative end-of-life care settings and approaches that relieve suffering for those with terminal diseases. Over the last few decades in the United States, a significant change in the site of death has occurred that coincides with patient and family preferences. Nearly 60% of Americans died as inpatients in hospitals in 1980. By 2000, the trend was reversing, with $\sim 31\%$ of Americans dying as hospital inpatients (**Fig. 10-1**). This shift has been most dramatic for those dying from cancer and COPD and for younger and very old individuals. In the last decade, it has been associated with the increased use of hospice care; in 2008, approximately 39% of all decedents in the United States received such care. Cancer patients currently constitute $\sim 36.9\%$ of hospice users. About 79% of patients receiving hospice care die out of the hospital, and around 42% of those receiving hospice care die in a private residence. In addition, in 2008, for the first time, the American Board of Medical Specialties (ABMS) offered certification in hospice and palliative medicine. With shortening of hospital stays,