

estrogen action; *aminoglutethimide*, an adrenocorticosteroid-inhibiting agent that produces a “medical adrenalectomy”; and *goserelin* and *leuprolide*, which inhibit testosterone secretion in advanced prostatic cancer and inhibit production of estrogen in advanced breast cancer.

INDIVIDUAL DRUGS

Cytotoxic antineoplastic drugs are listed in Drugs at a Glance: Cytotoxic Antineoplastic Drugs; hormones and hormone inhibitors are listed in Drugs at a Glance: Antineoplastic Hormones and Hormone Inhibitors.

CYTOPROTECTANT DRUGS

Cytoprotectants reduce the adverse effects of cytotoxic drugs, which may be severe, debilitating, and life threatening (Box 64–2). Severe adverse effects may also limit drug dosage or frequency of administration, thereby limiting the effectiveness of chemotherapy. Several cytoprotectants are available to protect certain body tissues from one or more adverse effects and allow a more optimal dose and schedule of cytotoxic agents. To be effective, administration and scheduling must be precise in relation to administration of the cytotoxic agent. A cytoprotective agent does not prevent or treat all adverse effects of a particular cytotoxic agent and it may have adverse effects of its own.

Amifostine produces a metabolite that combines with cisplatin and ameliorates cisplatin-induced renal damage. **Dexrazoxane** decreases cardiac toxicity of doxorubicin. **Erythropoietin, filgrastim, oprelvekin, and sargramostim** are colony-stimulating factors (see Chap. 44) that stimulate the bone marrow to produce blood cells. Erythropoietin stimulates production of red blood cells and is used for anemia; oprelvekin stimulates production of platelets and is used to prevent thrombocytopenia; filgrastim and sargramostim stimulate production of white blood cells and are used to reduce neutropenia and the risk of severe infection. **Leucovorin** is used with high-dose MTX. **Mesna** is used with ifosfamide, which produces a metabolite that causes hemorrhagic cystitis. Mesna combines with and inactivates the metabolite and thereby decreases cystitis. Dosages and routes of administration for these medications are listed in Drugs at a Glance: Cytoprotective Agents.

Nursing Process

Assessment

Assess the client’s condition before chemotherapy is started and often during treatment. Useful information includes the type, grade, and stage of the tumor as well as the signs and symptoms of cancer. General manifestations include ane-

mia, malnutrition, weight loss, pain, and infection; specific manifestations depend on the organs affected.

Assess for other diseases and organ dysfunctions (eg, cardiac, renal or hepatic) that influence response to chemotherapy.

Assess emotional status, coping mechanisms, family relationships, and financial resources. Anxiety and depression are common features during cancer diagnosis and treatment.

Assess laboratory test results before chemotherapy to establish baseline data and during chemotherapy to monitor drug effects:

- **Blood tests for tumor markers** (tumor-specific antigens on cell surfaces). Alpha-fetoprotein is a fetal antigen normally present during intrauterine and early postnatal life but absent in adulthood. Increased amounts may indicate hepatic or testicular cancer. *Carcinoembryonic antigen* (CEA) is secreted by several types of malignant cells (eg, CEA is present in approximately 75% of people with colorectal cancer). A rising level may indicate tumor progression and levels that are elevated before surgery and disappear after surgery indicate adequate tumor excision. If CEA levels rise later, it probably indicates tumor recurrence. In chemotherapy, falling CEA levels indicate effectiveness. Other tumor markers are *immunoglobulins* (elevated levels may indicate multiple myeloma) and *prostate-specific antigen* (elevated levels may indicate prostatic cancer).
- **Complete blood cell count (CBC)** to check for anemia, leukopenia, and thrombocytopenia because most cytotoxic antineoplastic drugs cause bone marrow depression. A CBC and white blood cell differential are done before each cycle of chemotherapy to determine dosage and frequency of drug administration, to monitor bone marrow function so fatal bone marrow depression does not occur, and to assist the nurse in planning care. For example, the client is very susceptible to infection when the leukocyte count is low, and bleeding is likely when the platelet count is low.
- **Other tests.** These include tests of kidney and liver function, serum calcium, uric acid, and others, depending on the organs affected by the cancer or its treatment.

Nursing Diagnoses

- Pain, nausea and vomiting, weakness, and activity intolerance related to disease process or chemotherapy
- Imbalanced Nutrition: Less Than Body Requirements related to disease process or chemotherapy
- Anxiety related to the disease, its possible progression, and its treatment
- Ineffective Family Coping related to illness and treatment of a family member
- Deficient Fluid Volume related to chemotherapy-induced nausea, vomiting, and diarrhea
- Risk for Injury: Infection related to drug-induced neutropenia; bleeding related to drug-induced thrombo-