adjacent to the original site) or advanced (widespread throughout the body). Obviously the best prognosis is directly related to early detection of the tumor.

Because the majority of pediatric cancers respond well to chemotherapy, more conservative surgical excision is increasingly used in a variety of tumors in an attempt to preserve function and cosmesis. For example, in some types of bone cancer, such as osteosarcoma, patients are successfully treated with resection of the diseased portion of the bone rather than amputation. There is an increasing emphasis on the use of combination drug therapy and radiotherapy after limited surgical intervention.

Chemotherapy

Chemotherapy may be the primary form of treatment, or it may be an adjunct to surgery or radiotherapy. The majority of chemotherapy agents work by interfering with the function or production of nucleic acids, deoxyribonucleic acid (DNA), or ribonucleic acid (RNA). Although several drugs with antineoplastic capabilities have been effective in treating different forms of cancer, the remarkable survival rates have been the result of improved combination drug regimens. Combining drugs allows for optimum cell cycle destruction with minimum toxic effects and decreased resistance by the cancer cells to the agent.

In addition to more effective combinations of drugs, several advances in the administration of chemotherapy have permitted continuous or intermittent intravenous (IV) administration without multiple venipunctures. The use of venous access devices (e.g., catheters and implantable infusion ports) has greatly facilitated safe and effective drug administration with minimum discomfort for the child (see Chapter 20). Continuous infusions over an extended period using syringe pumps have made possible the administration of certain drugs (such as cytosine arabinoside) in higher doses with less toxicity than when the drug is administered intermittently.

Chemotherapeutic agents can be classified according to their primary mechanism of action. Alkylating agents replace a hydrogen atom of a molecule by an alkyl group. The irreversible combination of alkyl groups with nucleotide chains, particularly DNA, causes unbalanced growth of unaffected cell constituents so that the cell eventually dies. These agents have a steep dose-response curve and,