

past 20 years. The overall 5-year survival rate is 80% ([Scheurer, Lupo, and Bondy, 2016](#)). Vigorous treatment of childhood cancers has resulted in dramatically improved survival rates. However, treatment programs combining surgery, irradiation, and chemotherapy are not without their complications. Some may occur immediately, such as loss of a limb from surgical amputation. However, current concern is with late effects—adverse changes related to treatment modalities, interactions between modes of treatment, individual characteristics of the child, and the disease process that may appear months to years after lifesaving treatment. Because more children are being cured and surviving into adulthood, increasing documentation of late effects is emerging ([Table 25-3](#)). Almost no organ is exempt, and almost every antineoplastic agent (especially irradiation) is responsible for some adverse effect. Many factors influence the development of late effects from irradiation; some of the more important ones include the total cumulative dose given, the child's age (the younger the child, the more radiosensitive the body organs are), and the tumor's location.

Radiotherapy to growing bones or reproductive glands responsible for growth-related hormones can delay or stunt growth. Nurses must document growth by assessing height and weight at each visit. Radiotherapy and some chemotherapy agents can cause hormonal dysfunction, decreased fertility, and sterility. The potential for gonadal dysfunction depends on the child's age and sex, the type of treatment, and the duration and total doses of treatment. Nursing assessment must begin with careful documentation of the child's sexual development using the Tanner staging scale (see [Pubertal Sexual Maturation, Chapter 15](#)).

Irradiation to developing bone and cartilage may cause numerous abnormalities. Assessment includes close observation of the irradiated bone for defects, such as spinal kyphoscoliosis, functional limitations, and osteoporosis. Children who have received irradiation to the mandibular area are at risk for dental caries, arrested tooth development, and incomplete dental calcification. A careful assessment in children who have received irradiation is performed at each clinic visit.