

in deformity.

The first centers of ossification appear in 2-month-old embryos; and at birth, the number is approximately 400, about half the number at maturity. New centers appear at regular intervals during the growth period and provide the basis for assessment of bone age. Postnatally, the earliest centers to appear (at 5 to 6 months old) are those of the capitate and hamate bones in the wrist. Therefore radiographs of the hand and wrist provide the most useful areas for screening to determine skeletal age, especially before 6 years old. These centers appear earlier in girls than in boys.

Nurses must understand that the growing bones of children possess many unique characteristics. Bone fractures occurring at the growth plate may be difficult to discover and may significantly affect subsequent growth and development ([Urbanski and Hanlon, 1996](#)). Factors that may influence skeletal muscle injury rates and types in children and adolescents include the following ([Caine, DiFiori, and Maffulli, 2006](#); [Kaczander, 1997](#)):

- Less protective sports equipment for children
- Less emphasis on conditioning, especially flexibility
- In adolescents, fractures that are more common than ligamentous ruptures because of the rapid growth rate of the physeal (segment of tubular bone that is concerned mainly with growth) zone of hypertrophy

## **Neurologic Maturation**

In contrast to other body tissues, which grow rapidly after birth, the nervous system grows proportionately more rapidly before birth. Two periods of rapid brain cell growth occur during fetal life, a dramatic increase in the number of neurons between 15 and 20 weeks of gestation and another increase at 30 weeks, which extends to 1 year of age. The rapid growth of infancy continues during early childhood and then slows to a more gradual rate during later childhood and adolescence.

Postnatal growth consists of increasing the amount of cytoplasm around the nuclei of existing cells, increasing the number and intricacy of communications with other cells, and advancing their peripheral axons to keep pace with expanding body dimensions. This allows for increasingly complex movement and behavior.