The distal radius is the second most common site of physisal fracture, surpassed only by hand phalanges (Table 4.11). If each of the 14 phalanges on each hand is considered separately, then the distal radius is the most common site of physisal fracture.

Anatomy and Growth

The distal radial physis remains essentially transverse and uniplanar throughout the first 10 years of growth, and is the flattest of the large physes (proximal and distal femur, tibia and humerus, and distal radius). There is a slight convexity of the ulnar border of the radial physis which bends proximally. In adolescence the physis develops mild undulations [49]. The single ossification center first appears roentgenographically at age 11 months in girls and 13 months in boys [61]. Multiple small vessels enter the epiphysis circumferentially protecting it from ischemic necrosis; no cases are reported.

The distal radial physis provides approximately 80% of the growth of the radius (Fig. 10.1). The percentage contribution from the growth plate at each end of the radius is not constant. The proportion from the more active distal physis gradually increases until approximately 50% of growth has occurred, and then it becomes more constant (Fig. 10.2) [59, 60]. At age 5 years the distal radial growth plate contributes 85% of total growth, increasing to 90% by age 12 years [57]. Equally important in caring for a child with an injured physis is knowledge of the annual growth (Fig. 10.3) and the anticipated growth remaining (Fig. 10.4) [58–60].

The distal radius physis usually closes between 13 and 15 years in girls and between 15 and 17 years in boys. This is later than the proximal radius accounting for 100% of radial growth nearing maturity and 80% of growth overall.
Fig. 10.1
Percentage of growth supplied by each radial physis at birth, mid-childhood, and at maturity. (Adapted from Pritchett [57, 60], with permission)

Fig. 10.2
The percentage contribution of the distal radial physis to the growth of the radius. The vertical axis shows the relative activity of the distal physis. Line B indicates birth. The solid line is extrapolated back to prenatal bone formation. (Adapted from Pritchett [57, 60], with permission)

Fig. 10.3
The annual increment of growth for the distal radius from age 7 years to skeletal maturity. (Adapted from Pritchett [60], with permission)