

Transverse: Crosswise at right angles to the long axis of the bone

Oblique: Slanting but straight between a horizontal and a perpendicular direction

Spiral: Slanting and circular, twisting around the bone shaft

The twisting of an extremity while the bone is breaking results in a spiral break. If the fracture does not produce a break in the skin, it is a **simple**, or **closed, fracture**. **Open**, or **compound, fractures** are those with an open wound through which the bone protrudes. If the bone fragments cause damage to other organs or tissues (e.g., lung, liver), the injury is said to be a **complicated fracture**. When small fragments of bone are broken from the fractured shaft and lie in the surrounding tissue, the injury is a **comminuted fracture**. This type of fracture is rare in children. The types of fractures that are seen most often in children are described in [Box 29-1](#) and [Fig. 29-2](#).

Box 29-1

Types of Fractures in Children

Plastic deformation: Occurs when the bone is bent but not broken.

A child's flexible bone can be bent 45 degrees or more before breaking. However, if bent, the bone will straighten slowly but not completely, producing some deformity but without the angulation seen when the bone breaks. Bends occur most commonly in the ulna and fibula, often in association with fractures of the radius and tibia.

Buckle, or torus, fracture: Produced by compression of the porous bone; appears as a raised or bulging projection at the fracture site. These fractures occur in the most porous portion of the bone near the metaphysis (the portion of the bone shaft adjacent to the epiphysis) and are more common in young children.

Greenstick fracture: Occurs when a bone is angulated beyond the limits of bending. The compressed side bends, and the tension side fails, causing an incomplete fracture similar to the break observed when a green stick is broken.