hanging freely at all times.

The specific nursing responsibilities for the patient in traction are outlined in the Nursing Care Guidelines box earlier.

## Distraction

Unlike traction, which helps bones realign and fuse properly, **distraction** is the process of separating opposing bone to encourage regeneration of new bone in the created space. Distraction can also be used when limbs are of unequal lengths and new bone is needed to elongate the shorter limb.

### External Fixation

Monolateral, Taylor Spatial Frame, and **Ilizarov external fixators (IEFs)** are common external fixation devices. The IEF uses a system of wires, rings, and telescoping rods that permits limb lengthening to occur by manual distraction (Fig. 29-12). In addition to lengthening bones, the device can be used to correct angular or rotational defects or to immobilize fractures. The device is attached surgically by securing a series of external full or half rings to the bone with wires. External telescoping rods connect the rings to each other. Manual distraction is accomplished by manipulating the rods to increase the distance between the rings. A percutaneous osteotomy is performed when the device is applied to create a "false" growth plate. A special osteotomy or corticotomy involves cutting only the cortex of the bone while preserving its blood supply, bone marrow, endosteum, and periosteum. Capillary blood flow to the transected area is essential for proper bone growth. Cut bone ends typically grow at a rate of 1 cm (0.4 inches) per month. The IEF can result in up to a 15-cm (6-inch) gain in length.