

# Diseases of the Skeletal System

## BONE FRACTURES

**Contraindications/indications:** work proximal and distal to the site of injury but not on the fracture until complete union occurs (usually 6 to 8 weeks from injury, depending on individual factors such as age); obtain approval of client's doctor before performing bodywork.

**Simple (closed) fracture**—a complete break in a bone without protrusion from the skin.

**Compound (open) fracture**—a complete break in a bone with protrusion of the bone from the skin.

**Comminuted fracture**—a bone broken into several pieces (shattered).

**Greenstick fracture**—an incomplete break in a bone.

**Stress (fatigue) fracture**—tiny, sometimes microscopic, fracture in the bone.

**Impacted fracture**—one end of a broken bone is pushed into the other broken end of the bone.

**Avulsion fracture**—a piece of a bone is chipped or broken off.

**Depressed fracture**—a broken portion of a bone is pushed inward (e.g., skull fracture).

**Spiral fracture**—“twisting” fracture in which the fracture line wraps around a bone.

**Nonunion**—failure of the fractured ends of a bone to unite.

**Malunion**—faulty or poor union of the two fractured ends of a bone.

## SKELETAL DISORDERS

**Kyphosis (hyperkyphosis)**—exaggerated posterior curvature of the thoracic spine.

**Causes:** spinal disorders (e.g., bone disease, poor posture, weakened ligaments) resulting from trauma.

**Contraindications/indications:** do not massage in severe cases; consult with client's doctor.

**Lordosis (hyperlordosis)**—exaggerated anterior curvature of the lumbar spine.

**Causes:** spinal disorders (e.g., bone disease, poor posture, weakened ligaments) resulting from trauma.

**Contraindications/indications:** do not massage in severe cases; consult with client's doctor.

**Scoliosis**—lateral curvature of the spine; often creates a hanging arm length discrepancy and a “full chest” on the contralateral side; bracing is a common treatment; surgery is rare (only if very serious condition).

**Causes:** leg length discrepancy; spina bifida; spinal nerve root damage.

**Contraindications/indications:** do not massage in severe cases; consult with client's doctor.

**Cleft palate**—failure of the palatine processes of the maxillae bones in the face to fuse together during fetal development.

**Causes:** nutritional deficiencies.

**Contraindications/indications:** consult with client's doctor; avoid the area if painful.

A cleft lip or harelip (failure of the soft tissue over the lip to close together) may accompany a cleft palate.

**Osteoporosis** [*osteo* = bone; *porosis* = porous]—loss of bone tissue leading to weak, fragile bones; commonly leads to postural changes of the spine and bone fractures in the pelvis, hips, wrists, and vertebrae.

**Cause:** unknown; influenced by hormonal imbalances and insufficient levels of vitamin D or calcium.

**Contraindications/indications:** all bodywork should be light because although bones of the pelvis, lumbar, and cervical spine are most affected, all bones may be brittle; consult with client's doctor.

**Osteogenesis imperfecta**—defective development of connective tissue, particularly bone tissue; bone tissue becomes thin and fragile and often bows under weight-bearing forces; often accompanied by multiple bone fractures.

**Cause:** genetic trait causing abnormal synthesis of collagen, an elastic protein that makes up about 90% of bone tissue.

**Contraindications/indications:** massage is most often contraindicated; consult with client's doctor.

**Osteitis deformans (Paget disease)**—common chronic condition characterized by disorganized bone tissue reabsorption and reformation leading to thinning and thickening of bone tissue and overall brittle bones; microfractures are common; may be accompanied by deformed teeth, skull enlargement, osteoarthritis, nerve compression, and faulty hearing.

**Cause:** slow viral infection affecting osteoblasts and osteoclasts.

**Contraindications/indications:** massage is contraindicated because bones are fragile.

**Osteomalacia (rickets in small children)**—softening of bone and loss of bone mass; common in underdeveloped countries.

**Cause:** vitamin D deficiency.

**Contraindications/indications:** massage is contraindicated because of the fragile condition of the bones.

**Osteomyelitis**—painful infection of bone tissue and bone marrow; sometimes pus-filled abscesses form; leads to necrosis and destruction of bone tissue.

**Cause:** staphylococcal or streptococcal infection resulting from bone fracture, surgery, or a penetrating wound.

**Contraindications/indications:** massage is contraindicated; consult with client's doctor.