

Osteonecrosis is a disorder of bone that is estimated to affect 20,000 new patients per year in the United States. The majority of patients are between 20 and 50 years of age. Osteonecrosis means death of bone which can occur from an interruption of the blood supply or by some other means. When osteonecrosis occurs in the femoral head (the ball portion of the hip joint), a segment of bone dies, leading to collapse of the bone supporting the overlying cartilage, and resulting in painful degenerative arthritis. Osteonecrosis may be classified as traumatic (e.g., resulting from falls or accidents) or non-traumatic. Non-traumatic ON may occur due to drugs or other cell toxins (e.g., corticosteroids, excessive alcohol use), systemic disease (such as lupus), blood dyscrasias (such as sickle cell disease and other conditions causing excessive blood clotting), radiation, etc. While scientists have not determined the exact mechanism(s) regarding the development of osteonecrosis, a number of risk factors (e.g., corticosteroids, alcohol) have been identified.

The current clinical treatment of osteonecrosis is controversial and may vary from non-weight bearing to pharmaceuticals to surgical intervention. Painful end-stage osteonecrosis is most commonly treated with total joint replacement. As tissue engineering has evolved, there is increasing interest in orthobiologics including factor-, cell-, and scaffold-based treatments for osteonecrosis.