The acute stage is developed within 10 days after infection, and is characterized by edema, inflammatory response, thrombose of endothelial and periosteal vases, anoxia, eventually leading to bone infarct (Ciampolini and Harding, 2000; Nandi et al., 2016). If it is not properly treated, osteomyelitis can evolve from acute to chronic (Conterno and Turchi, 2013; Ciampolini and Harding, 2000). Between the acute and chronic stages, there is a substage, known as subacute, which is developed between two weeks and one month, and the symptoms of both stages overlap.

In general, the chronic stage is characterized by a recurrent or intermittent infection that may persist for months. Furthermore, chronic osteomyelitis is also marked by osteosis, presence of sequestrum, poor vascularization due to inflammation of the surrounding blood vessels, increase in intraosseous pressure, pus, and recurrent fistula formation. At this stage, there is bone degeneration, which occurs through action of osteoclasts, and decreased osteoblast activity. This disequilibrium in bone metabolism is mainly induced by cytokines (interleukins 1 and 6, and tumor necrosis factors alpha and beta) produced by the immunological system after interacting with bacteria. The macrophages present in the infected site are induced to differentiate themselves into osteoclasts, which increase bone resorption. At this point, the treatment becomes more difficult, because the sequestrum acts as a barrier against drugs that could kill the pathogen agents that cause osteomyelitis (Maffulli et al., 2016; Winkler and Haiden, 2016; Ciampolini and Harding, 2000; Nandi et al., 2016; Lew and Waldvogel, 2004; Chen et al., 2007; Inzana et al., 2016; Raphel et al., 2016; Sun et al., 2017).

Physicians use another classification in their clinics. Clinically, chronic osteomyelitis is classified in accordance with the Cierny-Mader system, which is based on the following parameters: patient's conditions, functional compromising of bone tissue caused by osteomyelitis, infection site, and extension of bone necrosis. Once considered, these parameters are used in a classification that combines anatomic and physiologic infection features. The anatomic classification (Fig. 14.2) takes into account the infection extension and is divided into four stages:

(I) Medullary osteomyelitis—the osteomyelitis is restricted to the bone marrow cavity.
(II) Superficial osteomyelitis—the osteomyelitis is on the surface of the cortical bone.
(III) Localized osteomyelitis—it is a combination of medullary and superficial osteomyelitis because it involves the cortical bone and the bone marrow cavity.
(IV) Diffuse osteomyelitis—it involves the whole bone thickness, compromising the adjacent soft tissue (Winkler and Haiden, 2016; Cierny et al., 2003).