# Hyperbaric Oxygen Treatment of Chronic Refractory Osteomyelitis (CRO)

## What is CRO?

Osteomyelitis is infection of the bone or its marrow, caused by bacteria or mycobacteria. It becomes "refractory osteomyelitis" when chronic osteomyelitis does not respond to, or returns after, appropriate treatment. Those presenting with osteomyelitis of the skull, spine, or sternum, are at higher risk for morbidity and mortality. [1]

## Why is CRO difficult to treat?

Due to the relative paucity of blood vessels in bone and the fact that many antimicrobials do not penetrate bone well. [1]

NOTE: Infection within a bone is one of the causes of a non-healing wound; there is decreased oxygen content within infected bones.

## Standard Treatment of CRO

Standard treatment includes surgical debridement and antibiotics. A wound may be classified as "chronic" and "refractory" after several weeks of standard treatment proves ineffective (non-healing wound). [1]

## Hyperbaric Oxygen Therapy (HBOT)

HBOT increases the oxygen content to normal or above normal levels. The leukocyte-mediated killing of gram-positive organisms like *S. aureus* as well as some gram-negative microbes is restored when the oxygen content of infected bone is increased with HBOT. The transport of antibiotics such as aminoglycosides and cephalosporins into the infected bone is improved and increased with adjunctive HBOT. [1]

The American Heart Association (AHA) considers HBOT a **Class II recommendation** for the treatment of chronic refractory osteomyelitis. [2]

If a patient is diagnosed with a Wagner grade III or IV diabetic foot ulcer (DFU) with osteomyelitis, Hyperbaric Oxygen Therapy is considered an **AHA Class I intervention**. [2]

Source:
[1] Hanley, M. E., Hendriksen, S., & Cooper, J. S. (2022). Hyperbaric treatment of chronic refractory osteomyelitis. In *StatPearls [Internet]*. StatPearls Publishing.
[2] American Heart Association