

# ` Quick Review of Model System Research

## The Effect of Zoledronic Acid on Attenuation of Bone Loss at the Hip and Knee Following Acute Traumatic Spinal Cord Injury: A Randomized-Controlled Study

### What is the study about?

### This study aims to examine the effect of early intravenous (IV) zoledronic acid (ZA) on bone markers and areal bone mineral density (aBMD) in persons with acute ASIA Impairment Scale (AIS) A traumatic spinal cord injury (SCI) (i.e., a person with no motor or sensory function preserved in the sacral segments S4-S5). In the first few weeks after an SCI a process of rapid bone remodeling occurs, with resorption exceeding formation, leading to bone loss. Zoledronic acid (ZA) is the most potent of the bisphosphonates, a class of medication that affects the ability of the osteoclast to further resorb bone, resulting in relative bone preservation.

### What did the study find?

This study found that a single dose of 5 mg IV ZA maintains bone at the hip and knee at 4 months, significantly reduces bone loss at the hip, and partially reduces loss at the knee at 1 year post injury. Combined interventions will likely be needed to fully maintain bone density beyond the first several months of SCI.

### Who participated in the study?

Individuals with a with acute AIS A traumatic SCI (n=15), aged 19-65.

### How was the study conducted?

This study was a randomized double blind, placebo-controlled trial study with participants receiving 5 mg intravenous ZA vs. placebo 12-21 days after injury.

### How can people use the results?

### Individuals with TBI and their families can use the results of this study to better understand the IV ZA treatment and how it is effective. Practitioners can incorporate the results of this study into updating treatment protocols for SCI patients who are experiencing bone loss.

### Reference

Oleson, C.V., Marino, R.J., Formal, C.S., Modlesky, C.M., & Leiby, B.E. (2020). The effect of zoledronic acid on attenuation of bone loss at the hip and knee following acute traumatic spinal cord injury: A randomized-controlled study. *Spinal Cord,* *58,* 921-929. doi:10.1038/s41393-020-0431-9

**Disclaimer**

The contents of this quick review were developed under a grant from the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR grant number 90DP0082). NIDILRR is a Center within the Administration for Community Living (ACL), Department of Health and Human Services (HHS). The contents of this quick review do not necessarily represent the policy of NIDILRR, ACL, HHS, and you should not assume endorsement by the Federal Government.