



Osteoporosis and Spinal Cord Injury

Bone loss is one of the inevitable complications of spinal cord injury. But while osteoporosis in the SCI population first was studied in relation to calcium metabolism and the hypercalcemia and renal calculi that followed, there appear to be differences between SCI-induced osteoporosis and other causes of bone loss, such as prolonged bedrest and space travel.

Hypercalciuria (calcium dumped from the bones to the urine) is seen by 10 days following the SCI and reaches a peak 1-6 months postinjury. This level of hypercalciuria is 2-4 times that of persons without SCI who undergo prolonged bedrest. This increase is the direct result of a metabolic imbalance between bone formation and bone resorption. This model at the skeletal level following SCI resembles the high bone turnover rate seen in postmenopausal women.

Bone loss following SCI occurs throughout the skeletal system, with the exception of the skull. The distal femur and proximal tibia are the bones most affected, followed by the pelvis and the arms. The amount of demineralization in the skull, pelvis, and lower limbs is independent of the neurologic level.

In people with injury less than 1 year, reduction in bone mineral densities has been noted in the femur as much as 43 percent, as compared with controls. Over 50 percent of bone content in these regions is demineralized at the 10-year anniversary of the injury. (Bone fractures usually do not occur until bone mass is 30-40% below normal. Data from the Model SCI Systems show that 14 percent of people with SCI get fractures five years after injury. This increases to 28 percent after 10 years and 39 percent after 15 years. The frequency of fractures increases with age and completeness of injury, and is higher in women than men.)

The arms and trunk actually increase bone content after the 4-month point; the net effect is an approximate 10-21 percent loss of bone at the 10-year point. The trunk has a net gain in mineral content by 12 years post-injury.

Web Sites

Osteoporosis and Spinal Cord Injury

<http://www.craighospital.org/SCI/METS/osteoporosis.asp>

Craig Hospital: Osteoporosis

<http://emedicine.medscape.com/article/322204-overview>

Medscape Reference: Osteoporosis and Spinal Cord Injury

<http://sci.washington.edu/info/forums/reports/osteoporosis.asp>

Northwest Regional Spinal Cord Injury System: Osteoporosis in SCI

This page has text and video of an October 9, 2007 presentation by Jelena Svircev, MD, assistant professor in the Department of Rehabilitation Medicine at the University of Washington.

<http://www.spinalcord.uab.edu/show.asp?durki=21570>

Spinal Cord Injury Information Network: Osteoporosis (Bone Loss)

<http://www.spinalcord.uab.edu/show.asp?durki=97417>

Spinal Cord Injury Information Network: Secondary Conditions of Spinal Cord Injury Health Education Video Series

The 19-minute Bone Health video discusses aspects of heterotopic ossification (classifications, etiology, diagnosis, prevention and treatment options) and osteoporosis (initial bone loss after traumatic injury, impact of aging, impact of menopause, prevention and treatment options). The video can be downloaded or streamed online.

Osteoporosis in General

<http://www.nlm.nih.gov/medlineplus/osteoporosis.html>

Medline Plus: Osteoporosis

<http://www.nof.org/>

National Osteoporosis Foundation (NOF)

1150 17th Street NW, Suite 850
Washington, DC 20036
Phone: 202-223-2226, 800-231-4222 (Toll-free)

http://www.nofstore.org/Merchant2/merchant.mvc?Screen=PROD&Product_Code=B107-0908-PB&Category_Code=CR&Product_Count=7

NOF: Boning Up on Osteoporosis – A Guide to Prevention and Treatment

www.niams.nih.gov/Health_Info/Bone/

NIH Osteoporosis and Related Bone Diseases National Resource Center

2 AMS Circle
Bethesda, MD 20892-3676
Phone: 202-223-0344, 800-624-2663 (Toll-free), 202-466-4315 (TTY)
E-mail: NIHBoneInfo@mail.nih.gov

<http://www.osteofound.org/>

International Osteoporosis Foundation

9, rue Juste-Olivier
CH-1260 Nyon
Switzerland
Phone: +41 22 994 0100
E-mail: info@iofbonehealth.org

<http://orthoinfo.aaos.org/topic.cfm?topic=A00232>

American Academy of Orthopaedic Surgeons: Osteoporosis

<http://bestbonesforever.gov/>

Best Bones Forever

Best Bones Forever!TM is a national bone health campaign aimed at girls ages 9-14 and their parents.

The following books and videos are available for free loan from the PRC library. For more information, please see www.paralysis.org and click *Borrow from Our Lending Library* under PRC Quick Links.

Books

- Cook, Allan. **Osteoporosis Source Book**. Detroit, MI: Omnigraphics, 2001.
- Davis, Amelia. **Faces of Osteoporosis: And the Stories Behind Them**. New York: Demos, 2006.
- Hodgson, Stephen. **Mayo Clinic on Osteoporosis**. Rochester, MN. Mayo Foundation for Medical Education and Research, 2003.
- O'Connor, Carolyn Riester and Sharon Perkins. **Osteoporosis for Dummies**. Hoboken, NJ: Wiley, 2005.

Videos

- **The Challenge of Osteoporosis for People with Disabilities: A Look at Risk Factors and Prevention**. United Cerebral Palsy of NY City, Inc., 2000. VHS and DVD. (15 minutes)
- **Osteoporosis: Prevention & Treatment**. International Television Network, 2006. DVD. Healthy Body Healthy Mind TV series.

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