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Own the Bone User Survey Feedback

Thank you to the users who completed Own the Bone satisfaction surveys earlier this year. Your valuable feedback has helped us develop exciting program enhancements that will be released throughout the rest of this year.

Updates were recently made to the web-based registry based on suggestions provided by our sites and the Own the Bone Multidisciplinary Advisory Board. Own the Bone subscribers recently received an e-mail with more details regarding these registry changes. To see a detailed list of the registry changes and upgrades, subscribers can log into the registry and click on "registry update log" in the "resources" box in the upper right of the registry homepage. Users should also download the updated Case Reports Forms, also available in the "resources" box on the registry homepage, to ensure they are recording the updated information.

In addition to the registry changes, Own the Bone is developing a new discussion forum for Own the Bone users. The discussion forum will be hosted on the The American Orthopaedic Association's website, and will allow Own the Bone users to share best practices, ask questions, and interact with each other. Look for more information about the Own the Bone user forum later this fall.

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Summer 2013

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The American Orthopaedic Association's Own the Bone® program is a national post-fracture, systems-based, multidisciplinary fragility fracture prevention initiative. Its Web-based program and 10 prevention measures transform the way your hospital treats fracture patients.

The ultimate goal is to change physician and patient behavior to reduce incidence of future fractures and positively impact osteoporosis treatment.

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DNA Damage Drives Accelerated Bone Aging via an NF- κ B-Dependent Mechanism

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Rare Mutation Confers High Risk of Osteoporosis and Certain Cancers

Diabetic Women Experience More Hip Bone Loss at Menopause

Program Updates and Announcements:

Welcome New Own the Bone Sites

Own the Bone welcomes the following institutions and congratulates those that are the first in their state to implement Own the Bone.

- Athens Orthopedic Clinic, Athens, GA
- Beatrice Community Hospital and Health Center, Beatrice, NE
- Concord Hospital, Concord, NH
- HealthCare Midwest Bone Health, Kalamazoo, MI
- Hoag Orthopedic Institute, Irvine, CA
- New Hampshire NeuroSpine Institute, Bedford, NH (First in state New Hampshire)
- Paramount Care, Inc., Maumee, OH
- ProMedica Bay Park Hospital, Oregon, OH
- Reno Orthopaedic Clinic, Reno, NV (First in state Nevada)
- Sprenger Health Care Systems, Lorain, OH

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Own the Bone Registry Training – Tuesday, August 6

Own the Bone subscribers can join us on Tuesday, August 6 at 10:00am EDT for a complimentary live registry training hosted by Clinipace, the Own the Bone registry provider.

This session will provide existing Own the Bone sites an opportunity to learn the technical aspects of using the Own the Bone web-based registry, such as entering patient data, producing reports, generating patient and physician letters and more.

[Click here to register.](#)

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Upcoming Bone Health Conferences: Learn More about Own the Bone

Own the Bone participating sites will be presenting on their experience with secondary fracture prevention and Own the Bone at a number of meetings throughout the fall. Click on any of the meeting titles to go to their website to learn more.

- [Physician Assistants in Orthopaedic Surgery 14th Annual Conference](#), September 9-13, San Antonio, TX. Own the Bone will be discussed during two lectures: An Essential Skills Lecture *"Setting Up a Fragility Fracture Clinic"* on Thursday, September 12 at 3:10pm and during the lecture *"Practical Management of Fragility Fracture Patient"* on Friday, September 13 at 9:45am.
- [Orthopaedic Trauma Association's 2013 Annual Meeting](#), October 9-12, Phoenix, AZ. Own the Bone will be presented during the session *"How to Establish and Run a Fragility Fracture Program"* on October 11 at 2:30pm.
- [American College of Rheumatology 2013 Annual Meeting](#), October 25-30, San Diego, CA. Own the Bone will be presented during the ACR Study Group *"A Multi-Disciplinary Approach to Post-Fracture Management"* on Tuesday, October 29 at 1:00pm.
- [US Bone and Joint Initiative's 2013 Musculoskeletal Summit: "Best Practices in Patient-Centered Musculoskeletal Care"](#) November 18 – 19, Washington, DC. Own the Bone will be discussed during *"Session Four: What are today's best practices for musculoskeletal conditions?"* on Tuesday, November 19 at 9:00am.

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Amgen is a member of the Own the Bone Educational Alliance

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Georgia Orthopaedic Society (GOS)

International Society for Clinical Densitometry (ISCD)

Michigan Orthopaedic Society (MOS)

National Association of Orthopaedic Nurses (NAON)

National Osteoporosis Foundation (NOF)

Texas Orthopaedic Association (TOA)

United States Bone and Joint Initiative (USBJI)

USBJI Celebrates 500th Fit to a T Session

Fit to a T, the US Bone & Joint Initiative's (USBJI) free public education program on bone health and osteoporosis, reached a milestone in May with the presentation of its 500th session.

Kimberly Templeton, MD, President USBJI, and Chair of the USBJI *Fit to a T* Task Force noted, "We developed *Fit to a T* as a sustainable public education program, in response to the Surgeon General's Report on Bone Health and Osteoporosis. Bone health has a significant impact on overall health for everyone, regardless of race or whether you are male or female. Participants in the program learn how to maintain their bone health and how to identify their own risk factors for bone loss and osteoporosis. Being able to celebrate the 500th session demonstrates the continued public interest in this topic."

Dr. Templeton continued, "More and more people are hearing about osteoporosis and low bone density. This program provides information on the basics of bone health, factors that can lead to loss of bone, ways to avoid a fracture, and the prevention, early detection, diagnosis, and treatment of osteoporosis. It also raises awareness of the impact of bone loss among people not typically thought to be at risk for developing osteoporosis, especially men and African Americans," Dr. Templeton said.

Relevant to all ages, *Fit to a T* is targeted at men and women in their mid-40s to late 60s, as well as seniors and others who have had or are at risk of having a broken bone. To schedule a session in your community, contact Shari Maier, USBJI Program Coordinator, (847) 430-5054, or e-mail smaier@usbji.org.

The US Bone and Joint Initiative is an Own the Bone Organizational Alliance member.

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Own the Bone Organizational Alliance Member Education Activities

- **August 7, 1:00pm ET – National Osteoporosis Foundation, Free Webinar "Closing the Care Gap: Clinical Bone Health Education"**. Save the date for this free webinar to hear Shari Silverstein, RN, MS speak on the clinical approach to better bone health through the life stages. This activity is designed for nurses working in a variety of health care settings and who work with individuals of all ages who are at risk for osteoporosis and future fractures.
- **September 26 – 29, 68th Georgia Orthopaedic Society Annual Meeting, The Cloister on Sea Island, Georgia**. 9 CMEs available! The Presidential Guest Speaker will be Kevin J. Bozic, MD, MBA, Professor and Vice Chair, UCSF, Department of Orthopaedic Surgery, Core Faculty, Philip R. Lee Institute for Health Policy Studies.
- Pursue your educational goals and gain more knowledge in the field of Skeletal Health Assessment by attending one of ISCD's Live Summer Courses in Bone Densitometry or Body Composition Analysis.

OSTEOPOROSIS: Essentials for Clinicians

Course Brochure

Seattle, WA: July 27-28, 2013

Salt Lake City, UT: August 10-11, 2013

Atlanta, GA: August 24-25, 2013

OSTEOPOROSIS: Essentials for Technologists

Course Brochure

Seattle, WA: July 27-28, 2013

Salt Lake City, UT: August 10-11, 2013

Atlanta, GA: August 24-25, 2013

DXA Body Composition Analysis Course

Course Brochure

Salt Lake City, UT: August 11, 2013

- Save the Date: IOF - ISCD Skeletal Health 2014 Orlando, "Current Concepts in Osteoporosis Assessment & Management," February 20-22, 2014.

[Return to Headlines](#)**Bone Health News:****Smoke Carcinogens Cause Bone Loss Through the Aryl Hydrocarbon Receptor and Induction of Cyp1 Enzymes**

Researchers say that the smoke toxins benzo(a)pyrene (BaP) and 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) interact with the aryl hydrocarbon receptor (Ahr) to induce osteoclastic bone resorption through the activation of cytochrome P450 1a/1b (Cyp1) enzymes. BaP and TCDD enhanced osteoclast formation in bone marrow cell cultures and gavage with BaP stimulated bone resorption and osteoclastogenesis in vivo. The osteoclastogenesis triggered by BaP or RANK-L was reduced in Ahr^{-/-} cells, consistent with the high bone mass noted in Ahr^{-/-} male mice. Furthermore, the osteoclastogenesis induced by TCDD was lower in Cyp1a1/1a2^{-/-} and Cyp1a1/1a2/1b1^{-/-} cultures, indicating that Ahr was upstream of the Cyp enzymes. Likewise, the pharmacological inhibition of the Cyp1 enzymes with tetramethylsilane or proadifen reduced osteoclastogenesis. Finally, deletion of the Cyp1a1, Cyp1a2, and Cyp1b1 in triple knockout mice resulted in reduced bone resorption and recapitulated the high bone mass phenotype of Ahr^{-/-} mice. In conclusion, the data identify the Ahr and Cyp1 enzymes not only in the pathophysiology of smoke-induced osteoporosis, but also as potential targets for selective modulation by new therapeutics.

From "Smoke Carcinogens Cause Bone Loss Through the Aryl Hydrocarbon Receptor and Induction of Cyp1 Enzymes"

Proceedings of the National Academy of Sciences (05/21/13) Iqbal, Jameel; Sun, Li; Cao, Jay; et al.

[Return to Headlines](#)**Abdominal CT Scan May Double as Bone Study**

Researchers at the University of Wisconsin have found that abdominal CT scans could be used to screen for osteoporosis. The study, published in the *Annals of Internal Medicine*, examined 1,867 adults who underwent a dual-energy X-ray absorptiometry scan and an abdominal CT scan within six months of each other. Although the CT scans were performed for reasons unrelated to bone health, researchers found that they were effective at distinguishing between osteoporosis and osteopenia and normal bone mineral density (BMD). One of the benefits of using CT scans, researchers noted, is that they do not require any additional cost, time, or radiation if they are able to accurately assess BMD.

From "Abdominal CT Scan May Double as Bone Study"

MedPage Today (04/15/13) Fiore, Kristina

[Return to Headlines](#)**Decoding the Structure of Bone**

Researchers at the Massachusetts Institute of Technology (MIT) have performed a study that they say will contribute to a new understanding of bone's molecular structure and function. The study, published in the journal *Nature Communications*, used supercomputers to produce images of bone at the molecular level that showed how collagen and hydroxyapatite combine to form bone. Researchers found that collagen and hydroxyapatite are held together by electrostatic interactions, which allows them to slip against each other somewhat without breaking. It also allows the two materials to contribute the best of their properties so that the bone is simultaneously hard and tough, like hydroxyapatite, and slightly flexible, like collagen. The findings could lead to a greater understanding of how bones are affected by osteoporosis and other diseases.

From "Decoding the Structure of Bone"

HealthCanal.com (04/16/2013) Chandler, David L.

[Return to Headlines](#)**Fluoride No Help in Osteopenia**

A study published in the *Journal of Clinical Endocrinology and Metabolism* has found

that post-menopausal women with osteopenia who consumed low doses of fluoride did not experience improvements in bone mineral density (BMD). Researchers examined 180 female osteopenia patients who were at least five years past menopause and gave them a placebo or one of three doses of fluoride: 2.5 mg, 5 mg, or 10 mg. None of those three doses significantly increased BMD of the lumbar spine, total hip, or total body, though researchers found that 5 mg and 10 mg doses did weakly activate bone remodeling by increasing levels of procollagen type-I N-terminal propeptide. Experts say the findings confirm their belief that fluoride is not an effective treatment for osteoporosis.

From "Fluoride No Help in Osteopenia"
MedPage Today (04/11/13) Fiore, Kristina

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New Study Parts with Prior Recommendation Against Calcium and Vitamin D for Women Past Menopause

A new study published in the journal *Menopause* finds that post-menopausal women who take calcium and vitamin D supplements in addition to therapeutic hormones may suffer fewer hip fractures. Researchers examined the health records of roughly 36,000 post-menopausal women enrolled in the Women's Health Initiative clinical trials for hormone therapy between 1993 and 1998. The researchers found that women who were taking hormones as well as calcium and vitamin D supplements were roughly half as likely to fracture a hip as those women taking no hormones or supplements. Researchers say that the effect became stronger the higher the dosage of supplements the woman was taking, and that the effect appeared to be synergistic. Women on both hormone treatments and supplements were less likely to experience fractures than those that were only taking supplements or only receiving the hormone treatment. The researchers note that their results differ from a US Preventive Services Task Force recommendation from earlier this year, which found insufficient evidence to recommend supplement doses greater than 400 mg of vitamin D and greater than 1,000 mg of calcium for prevention of fractures in post-menopausal women.

From "New Study Parts with Prior Recommendation Against Calcium and Vitamin D for Women Past Menopause"
DailyRx (06/25/13)

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Zoledronic Acid Acutely Increases Sclerostin Serum Levels in Women with Postmenopausal Osteoporosis

Researchers evaluated sclerostin serum levels after zoledronic acid administration and correlate variations with bone turnover markers. Forty women with postmenopausal osteoporosis were enrolled in this study and randomized into 2 groups to receive zoledronic acid (5 mg) or placebo. Sclerostin serum levels increased by day 2, reached a peak at day 7 (3-fold baseline, $P < .001$) and then decreased at day 30 and returned near to baseline after 360 days in the zoledronic acid group. Both C-telopeptide of type 1 collagen (CTX) and bone-specific alkaline phosphatase (BSAP) were reduced, and a significant negative correlation was observed between the percentage changes of sclerostin and the variation in BSAP and CTX at all time points in the zoledronic acid group ($P < .05$). No changes were observed in the placebo group.

From "Zoledronic Acid Acutely Increases Sclerostin Serum Levels in Women with Postmenopausal Osteoporosis"
Journal of Clinical Endocrinology & Metabolism (04/13) Catalano, Antonino ; Morabito, Nancy ; Basile, Giorgio

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Osteoporosis Management Guidelines Updated for Women and Men

The National Osteoporosis Guideline Group (NOGG) has announced updates to its guidelines on diagnosing and managing osteoporosis in postmenopausal women and men at least 50 years old in the United Kingdom. The [new recommendations](#) were published online June 17 in the journal *Maturitas*.

Highlights of the updated guidelines include that pharmacotherapies have shown to lower the risk for vertebral fracture (and for hip fracture in some cases) include bisphosphonates, denosumab, parathyroid hormone peptides, raloxifene, and strontium ranelate. Postmenopausal women may benefit from calcitriol, etidronate, and hormone replacement therapy. Calcium and vitamin D supplementation is widely recommended for older persons who are housebound or live in residential or nursing homes. Approved treatments for men at increased fracture risk are alendronate, risedronate, zoledronic acid, and teriparatide.

From "Osteoporosis Management Guidelines Updated for Women and Men"
Medscape (07/01/13) Barclay, Laurie

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Can a Metal Help Slow Down the Effects of Osteoporosis?

According to the National Osteoporosis Foundation, 9 million American adults suffer from osteoporosis. In addition, 48 million more have low bone mass which places them at increased risk for osteoporosis. There have been recent claims that over-the-counter supplements containing strontium can slow bone loss. Elizabeth Shane, professor of medicine at Columbia University Medical Center in New York, says that strontium ranelate does help prevent fractures caused by osteoporosis. However, it remains to be seen if over-the-counter supplements sold in the US, such as strontium citrate and strontium carbonate, are effective. Strontium ranelate is a powder made from strontium and sold as a prescription drug overseas.

It is worth noting that a committee of the European Medicines Agency conducted a study and found the drug is linked to increased risk of heart attacks and recommended its use for severe cases of osteoporosis only. Officials add that the drug should not be used by those with uncontrolled high blood pressure or cardiovascular disease. Currently, strontium ranelate is sold by Servier, a French pharmaceutical company. Felicia Cosman, senior clinical director of the National Osteoporosis Foundation, notes that while the drug has shown the ability to prevent fractures "its efficacy is not as good as the best drugs we have."

A rat study, published earlier this year in the journal *Bone*, found strontium citrate, a form used in supplements, is absorbed into bone at about the same rate as strontium ranelate. But the study didn't measure bone strength in the animals, says Karen A. Beattie, the study's author and a research scientist at Canada's McMaster University.

From "Can a Metal Help Slow Down the Effects of Osteoporosis?"
Wall Street Journal (06/10/13) Johannes, Laura

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DNA Damage Drives Accelerated Bone Aging via an NF- κ B-Dependent Mechanism

Researchers sought to determine how DNA damage leads to accelerated bone aging in mice. They examined progeroid excision repair cross complementary group 1-xeroderma pigmentosum group F (ERCC1-XPF)-deficient mice, including Ercc1-null (Ercc1-/-) and hypomorphic (Ercc1-/-) mice, and found that ERCC1 deficiency leads to DNA damage and several other problems. These problems in turn lead to increased secretion of inflammatory cytokines known to drive osteoclastogenesis, including the receptor activator of NF- κ B ligand (RANKL). Researchers found that using an I- κ B kinase (IKK) inhibitor to suppress NF- κ B signaling reversed cellular senescence and senescence-associated secretory phenotype (SASP) in Ercc1-/- bone marrow stromal cells (BMSCs). They concluded that the NF- κ B pathway is a novel therapeutic target for treating bone disease that occurs with age.

From "DNA Damage Drives Accelerated Bone Aging via an NF- κ B-Dependent Mechanism"
Journal of Bone and Mineral Research (05/13) Chen, Qian; Liu, Kai; Robinson, Andria R.; et al.

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Excessive Salt Consumption Appears to Be Bad for Your Bones

Researchers have found that a high salt diet raises postmenopausal women's risk of nonvertebral fracture. The researchers studied 213 postmenopausal women, with a

mean age of 63, who had undergone osteoporosis screening. Using data gathered from bone density scanning, food questionnaires, and blood work, among other tests, the researchers sorted the women based on salt intake. The group with the highest salt intake consumed an average of 7,561 milligrams of sodium per day, more than three times the recommended daily intake of 2,300 mg. Members of this group were more than four times likelier to have an existing nonvertebral fracture than members of the other groups. This held true even controlling for age, bone mineral density, body mass index, calcium and vitamin D levels, and other factors. The authors reported that the average sodium intake of all the women was still high, at 5,211 mg per day, even for the Japanese who on average consume just under 4,000 mg per day, more than the 3,400 mg consumed daily by the average American. Previous research has showed a connection between sodium intake and increases in bone breakdown and decreases in bone mineral density. The study was presented at the Endocrine Society's 95th Annual Meeting.

From "Excessive Salt Consumption Appears to Be Bad for Your Bones"
Science Codex (06/17/13)

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Rare Mutation Confers High Risk of Osteoporosis and Certain Cancers

The presence of the rare nonsense genetic mutation LGR4 results in an increased risk of osteoporosis and osteoporosis-related traits, a [study](#) published in the journal *Nature* has found. The study examined the whole genome sequencing of 2,230 Icelanders to look for gene mutations or other variations in the genome that could have a direct effect on the risk of pathologically low-bone density among a large number of sequence variants. Researchers identified 34 million sequence variants and analyzed them against 4,931 people with low-bone density disease and a large control population. They discovered a relationship between LGR4 and osteoporosis and osteoporosis-related traits. The study concludes that the presence of LGR4 increases the risk of osteoporosis and osteoporosis-related traits because of its effect on the Wnt signaling pathway.

From "Rare Mutation Confers High Risk of Osteoporosis and Certain Cancers"
News-Medical.net (05/06/2013)

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Diabetic Women Experience More Hip Bone Loss at Menopause

A study presented at the ASBMR Annual Meeting has found that post-menopausal diabetic women lose bone in their hips at a greater rate than post-menopausal women without diabetes. The study examined bone loss data for 2,245 women between the ages of 42 and 52 who took part in the Study of Women's Health Across the Nation. Researchers found that while diabetic women entered menopause with higher levels of bone mineral density in the hip than women without diabetes, the diabetic women lost bone in the hip at a rate that was 10 times faster than non-diabetic women after an average follow-up period of 3.3 years. The higher rates of bone loss among post-menopausal diabetic women may be due to the fact that diabetes impairs new bone formation and bone quality.

From "Diabetic Women Experience More Hip Bone Loss at Menopause"
News Fix (04/17/2013) Michaels, Geoff

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