



Children – Bones

Too little milk, sunshine and exercise: It is an anti-bone trifecta. And for some children, shockingly, it is leading to rickets, the soft-bone scourge of the 19th century.

But cases of full-blown rickets are just the red flag: Bone specialists say possibly millions of seemingly healthy children in the U.S. are not building as much strong bone as they should – a gap that may leave them more vulnerable to bone-cracking osteoporosis later in life than their grandparents are. “This potentially is a time-bomb,” says Dr. Laura Tosi, bone health chief at Children’s National Medical Center in Washington.

Now scientists are taking the first steps to track children’s bone quality and learn just how big a problem the anti-bone trio is causing, thanks to new research that finally shows just what “normal” bone density is for children of different ages.

Dr. Heidi Kalkwarf of the Cincinnati Children’s Hospital led a U.S. study that gave bone scans to 1,500 healthy children ages 6 to 17 to see how bone mass is accumulated. The result, published last summer: The first bone-growth guide, just like height-and-weight charts, for pediatricians treating children at high risk of bone problems.

Next, the government-funded study is tracking those 1,500 children for seven more years, to see how their bones turn out. Say a 7-year-old is in the 5-th percentile for bone growth. Does she tend to stay at that level by age 14, or catch up to kids with denser bones? If not, is she more prone to fractures?

Ultimately, the question is what level is cause for concern. “I don’t know if we’re raising a population that’s going to be at risk for osteoporosis,” Kalkwarf cautions. “It’s really hard to know what the cutoff is, how low is too low.”

But almost half of peak bone mass develops during adolescence, and the concern is that missing out on the strongest possible bones in childhood could haunt people decades later. By the 30s, bone is broken down faster than it is rebuilt. Then it is a race to maintain bone and avoid the thin bones of osteoporosis in old age.

“There’s some early data showing that even a 10 percent deficit in your bone mass when you finish your adolescent years can increase your potential risk of having osteoporosis and fractures as much as 50 percent,” says Dr. James Beaty, president of the American Academy of Orthopaedic Surgeons.

Already there’s evidence that U.S. children break their arms more often today than four decades ago – girls 56 percent more, and boys 32 percent more, according to a Mayo Clinic study. Kalkwarf’s hospital recently found that kids who break an arm have lower bone density than their playmates who don’t. That suggests the fracture rise isn’t due solely to newer forms of risky play, like inline skates.

And last year, government researchers found overweight children were more likely to suffer a fracture, even though theoretically their bones should be harder from carrying more weight. Maybe they have poorer balance; maybe they fall harder. Kalkwarf says there even are hints that fat itself may produce bone-harming substances.

Doctors have long known that less than a quarter of adolescents get enough calcium. But strong bones require more than calcium alone. Exercise is at least as important. Consider: The dominant arm of a tennis player has 35 percent more bone than the non-dominant arm.



And Canadian researchers recently reported that postmenopausal women who had exercised more as teens had 8 percent stronger bone decades later than their more sedentary counterparts.

Yet childhood exercise is dropping as obesity rises. Likewise, the body can't absorb calcium and harden bones without vitamin D. By some estimates, 30 percent of teens get too little.

It is not just that they do not drink fortified milk. Bodies make vitamin D with sunlight. With teen computer use, urban youngsters without safe places to play outdoors and less school P.E., it's no wonder D levels are low. Because skin pigment alters sun absorption, black children are particularly at risk.

Rickets marks the worst deficiency, where bones become so soft that legs literally bow. Rickets was once thought to have been eradicated with milk fortification, but "I am now treating rickets in a way that I never treated it 20 years ago," says Tosi, who diagnoses rickets or super-low D levels in children every month at a bone clinic she runs for mostly inner-city children.

Doctors who have never seen rickets can miss it. Charlene Bullock repeatedly asked her 5-year-old's doctor why his leg was bending inward and he could no longer run with his playmates. It took a trip to Tosi's special clinic to learn Na-shun had rickets – the once energetic child had quit running because his bones ached like an old man's.

Fortunately, rickets caught early is easily cured with high-dose infusions of vitamin D and calcium, and Bullock's son quickly rebounded. "He's doing everything with that little leg. "It is the children who low vitamin D has not gotten quite bad enough for symptoms that Tosi most worries about. They may never get treated.

Source: Associated Press, 11/26/2007.

Generations of Women Luncheon

Osteoporosis will affect one in two women over the age of 50, but prevention is possible. Please join us and hundreds of others at the May 9th, 2008 for Arizona Osteoporosis Coalition (AZOC) Generations of Women Luncheon at the Arizona Biltmore to make a difference in the health and lives of thousands of Arizonans.

When: **Friday, May 9th, 2008**
Where: **Arizona Biltmore, Phoenix**

Featuring four women from different generations sharing highlights of their lives.

- Jane Canby, Co-founder of the Arizona Osteoporosis Coalition
- MaryAnn Guerra, COO, Tgen
- Charli Turner Thorne, Head Coach, Arizona State University Women's Basketball
- Staff Sergeant Gayla C. Beasley, Weapons Director, 107th Air Control Squadron, Arizona Air National Guard

A Luncheon Ticket is \$200 or a table of ten for \$2,000. Purchase a ticket online at www.fitbones.org or mail check payable to AZOC at Arizona Osteoporosis Coalition, PO Box 6776, Chandler, AZ 85246.

AZOC is a 501c3, non-profit organization and the funds raised by the luncheon will make a tremendous difference in the bone health education outreach and

screening provided by the Arizona Osteoporosis Coalition.

Sponsors include Arizona Osteoporosis Coalition, Salt River Project, Southwest Gas, and TGen.

If you know of a company interested in sponsoring the Generations of Women Luncheon, information is online at www.fitbones.org or contact Kitty Woodward, Program Coordinator, at 602-749-1008.

Join us for Osteoporosis Day

Mark your calendar for March 25th from 9:00 a.m. to 3:00 p.m. Arizona Osteoporosis Coalition and Scottsdale Healthcare will be providing free ultrasound, bone density screening on the senate lawn outside the Arizona Legislature. Call Eva Paz-Ono, Program Coordinator, at 602-470-8086, extension 332 to volunteer to help that day or to help with planning.

Bone Builders Volunteer Training

Awareness and prevention are critical in combating the growing problem of osteoporosis. Volunteers are needed to teach others about reducing the risks of osteoporosis. The Bone Builders program is a partnership between the University of Arizona Cooperative Extension, Arizona Osteoporosis Coalition, and many other local organizations around the state to help women reduce their risks of developing osteoporosis.

Do you know a potential Bone Builder? It only takes a few hours a month to become a Bone Builders volunteer and make a difference in the health of women.

3 Bone Builders

The next volunteer training is scheduled for **April 24th and 25th**. The training will be held at the University of Arizona Cooperative Extension in Maricopa County, 4341 E. Broadway Rd., Phoenix.

For an application and more details call 602-470-8086, extension 332 or email shday@cals.arizona.edu or you can download the volunteer application at website www.bonebuilders.org under "volunteers."

Depression Connection

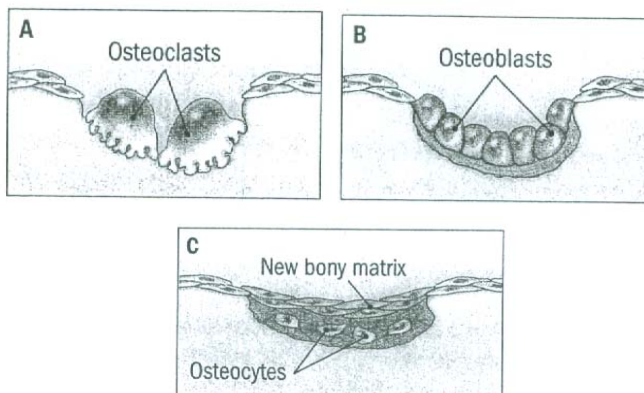
Over the past decade, researchers have investigated links between depression and bone loss. In 1996, a *New England Journal of Medicine* study found that women with a history of major depression had lower bone density at the hip and spine and higher levels of cortisol, a stress hormone associated with bone loss. Since then, many studies have found a similar relationship. Research has also linked selective serotonin reuptake inhibitor antidepressants with fractures, but cause and effect has not been established. It may be a long time before these connections are fully elucidated. In the meantime, women being treated for depression may want to talk to their clinicians about a BMD tests.

Source: Excerpt from *Harvard Women's Health Watch*, January 2008.

Bone Turnover Basics

Bone continually undergoes a process called remodeling, or bone turnover, which has two distinct stages: resorption (breakdown) and formation. Bone is a storage depot for calcium. When the body needs calcium, bone cells called osteoclasts attach to the bone surface and break it down, leaving small cavities (A). Bone-forming cells called osteoblasts move into these cavities (B), releasing collagen and other proteins to stimulate bone mineralization and replace what was lost. The osteoblasts that become incorporated in the new bone (matrix) are called osteocytes (C).

Early in life, bone formation outpaces resorption. By age 20, most of us have the greatest amount of bone tissue we'll ever have (peak bone mass). Bone mass declines very slowly until late perimenopause, when bone loss becomes more rapid, due in part to decreased estrogen, a crucial player in bone turnover. Also, after age 50 to 60 our bodies are less able to absorb calcium and produce vitamin D. We continue to lose bone, though more slowly, for the rest of our lives.



Source: *Harvard Women's Health Watch*, January 2008.

Calcium Bites

Vitamin D and Calcium Supplement Safety

Can you get too much of a good thing? Researchers at Duke University and the University of North Carolina Chapel Hill studied 232 elderly patients (95 with depression, 137 without depression). Calcium, vitamin D, and kilocalorie intake were determined through a food frequency questionnaire. Brain lesion volumes were calculated from magnetic resonance imaging (MRI) scan.

Calcium and vitamin D consumption were associated with brain lesions in elderly subjects. These associations may be due to a vascular calcification mechanism. Potential adverse effects of high intakes of calcium and vitamin D need to be studied.

Source: *Journal of the Federation of American Societies for Experimental Biology*.

www.fasebj.org/cgi/content/meeting_abstract/216/A1072

Calcium from Diet Better than Supplements

Researchers at the Washington University School of Medicine asked 183 women to record their diets and supplement intakes. They then divide them into three groups: those who got at least 70% of their daily calcium from pills, those who got at least 70% from diet and a diet-plus-supplement group whose calcium source fell somewhere between those ranges.

Women in the diet-plus-supplement group took in the most calcium (about 1600 mg/day) while the women relying mostly on pills got somewhat less (around 1030 mg/day). The women relying primarily on dietary calcium – mainly through dairy products – took in the least calcium (about 830 mg/day).

Adjusted BMD scores were significantly greater in the subjects who obtained calcium primarily from the diet or from both the diet and supplements than in those who obtained calcium primarily from calcium supplements at the spine ($P=0.012$), femoral neck ($P=0.02$), total femur ($P=0.003$), and intertrochanter ($P=0.005$). The researchers recommended that doctors tell their patients to use dairy sources for calcium, but, if they cannot get enough from their diet they should at least get it from supplements. An earlier study with calcium from supplement or milk were equally effective in slowing bone loss.

Source: *Tufts Health & Nutrition Letter*, September 2007 and *American Journal of Clinical Nutrition*, Vol. 85, No. 5, 1428-1433, May 2007.

Ten Year Fracture Risk

FORE – Foundation for Osteoporosis Research and Education announced that Dr. Bruce Ettinger, has developed a web-based tool that allows you to determine absolute fracture risk. Use of the tool is free of charge. It takes about a minute to enter age, bone mineral density (BMD), height and weight, and to click (yes/no) on seven other risk factors. The model immediately calculates 10-year fracture risks and shows that in an easy to understand graph that can be printed, saved, and used for patient counseling

Source: <http://riskcalculator.fore.org>

Vitamin D Deficiency: The Cause of Everything?

The University of Arizona Program in Integrative Medicine sponsored Louise Gagné, MD who presented a session on “Vitamin D Deficiency: The cause of everything?”. This talk reviewed vitamin D physiology, the consequences of deficiency and vitamin D’s emerging role as an immune modulator and cancer protective nutrient. It also covered who is at increased risk, who should be screened and which tests to order.

Louise Gagné is a family physician who practices integrative medicine at the Community Clinic in Saskatoon, Canada. Dr. Gagné is a graduate of the University of Arizona’s Fellowship in Integrative Medicine and is a Clinical Assistant Professor in the Department of Community Health and Epidemiology at the University of Saskatchewan.

You may view this presentation online via streaming video by visiting the UA Biomedical Communications at <http://streaming.biocom.arizona.edu/home/> and type in Vitamin D to view the session, “Vitamin D Deficiency: The

cause of everything?” Then just click on Watch and follow the directions. You will need Real Player or Windows Media Player which you can download for free from the website.

The Norwegian for Air Research has a nifty online calculator to help you figure out how much Vitamin D you will actually can produce in your skin on any given day of the year. You will need your latitude and longitude to complete the calculations.

Source: <http://zardoz.nilu.no/~olaeng/fastrt/VitD-ez.html>



Broccoli, Parmesan and Lemon

3 heads broccoli (about 3 pounds)
3 tablespoons olive oil
salt and freshly ground black pepper
1 cup freshly grated Parmigiano-Reggiano
1 lemon, juiced



Preheat the oven to 400 degrees F. Trim about 1 inch off the ends of the broccoli stalks and cut the broccoli lengthwise into spears. Arrange the broccoli on a nonstick cookie sheet, drizzle with some olive oil and season with a little bit of salt and a generous amount of freshly ground black pepper. Toss to coat evenly. Transfer to the oven and roast for 10 minutes.

Remove the broccoli from the oven and sprinkle the cheese evenly over the top and bake until the cheese melts and forms a crisp shell over the broccoli, about 10 minutes. Lift the broccoli out onto a platter with a spatula and drizzle with fresh lemon.

Nutrition Facts for 1 serving (approximately 4 broccoli spears): 110 calories; 5 g fat; **69 mg calcium**; 1.1 g fiber; 437 mg potassium; 250 mg trace sodium.

Source: *Tyler’s Ultimate* show from the Food Network, Episode *Ultimate Shrimp Scampi*, February 12, 2008.

Maricopa County News

2008 Walk Across Arizona

The Walk Across Arizona (WAAZ) event is now well under way. Steps . . . to a healthier you! Beginning Sunday, January 27, 2008, walkers formed teams in and around Maricopa County and began to Walk Across Arizona, a walking event, now in its 5th year, offered through the University of Arizona Cooperative Extension, Maricopa County, which spans 16 weeks. The WAAZ event offers a way to build healthy habits with family, friends and co-workers. Walkers, armed with step counting pedometers, walk weekly for a team goal, tracked by individual team captains.

Who's Walking in Maricopa County:

- ★ 146 Teams
- ★ 1,240 walkers, including 243 men and 991 women, 50 youth (18 and under), and 191 seniors (65 and older)
- ★ 58,000 miles walked by the end of Week 4



The walkers belong to maximum number of 10 member teams, with very creative names including *Sisterhood of the Shiny Shoes*, *Brain Train*, *We Don't Jog*, *Blister Sisters*, *Rowdy Ramblers*, *Compliance on Feet*, *Road Warriors*, *Toe Jams*, *Arizoniacs*, and *Move It!*, to name just a few! Several groups supporting multiple teams from businesses as well as community churches have involved hundreds of walkers! The creativity and competition is fun. All participants receive a step pedometer, a WAAZ t-shirt, weekly event newsletters, with fun and useful walking tips, general health and wellness tips, resources, and the opportunity to attend a variety of health and wellness related education classes scheduled over the course of 16 weeks.

Everyone is a winner! Participating walkers/teams will walk their way to a final wrap-up event at which recognition along with some grand prizes will be awarded to various teams and individual walkers who have achieved some remarkable walking results. However, the real prize is the health benefit imparted to every walker in the event. Here's to all the 2008 Walk Across Arizona participants! **Happy Walking!**

Source: Article submitted by Elizabeth Schnoll, Health Educator.

Eva Paz-Ono has returned as our Program Coordinator

She has re-instated the Bone Builders classes in low-income, reduced lunch school throughout Maricopa County while continuing to provide teachers in the Isaac School District with information and materials on nutrition and physical activity for approximately 1500 students in 12 schools. She hopes to re-energize our Bone Builders volunteers to get active and help us out with health fairs across the county.

From Eva's Desk

Since my return, we have reinstated the Bone Builders classes at low-income, reduced lunch parenting groups in Maricopa County.

We are actively participating in health fairs. My short term goals include:

- ★ Re-energize our Bone Builders Volunteers
- ★ Need current Bone Builders volunteer email addresses and phone numbers

Bone Builders Physical Activity Program - Spring/Summer 2008 Train-the-Trainer Event

Registration has begun for anyone interested in bringing this 9-week, low impact, beginning physical activity education program, targeting older inactive adults, to their group or programming site or center.

Training will be held Wednesday & Thursday, April 2nd & 3rd, 2008. The University of Arizona Cooperative

Extension Office, Maricopa County, will host the event and is located at 4341 E. Broadway Road in Phoenix.

The training is available for a tuition fee of \$75.00 for both days, which includes detailed instruction & speakers, curriculum book, class materials/supplies, program t-shirt and fee for newly required volunteer background check. Calcium rich healthy snacks, drinks & luncheon on Wednesday are included. Scholarships are available and will be considered based upon individual applicant's requests. Attendance is required for both days.

TRAINING SCHEDULE:

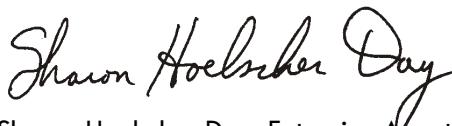
- **Day 1** – Wednesday, 4/2/08, 12:30pm check in, released by 4:00pm.
- **Day 2** – Thursday, 4/3/08, 8:30am check in, released by 3:00pm.

We welcome previously trained Bone Builders Physical Activity Program (BBPAP) volunteers to attend as a refresher training for the minimum fee of \$15.00 to cover meals & speaker fees.

Make checks payable to: **University of Arizona.**

Please contact Elizabeth Schnoll for more information about the program requirements for participants or for registration details @ 602-470-8086, Ext 324.

Remember.....No matter your age, it's never too late to get moving toward a more active life to support healthy bones as well as achieve better overall health and wellness.



Sharon Hoelscher Day, Extension Agent, Family & Consumer Sciences
Coordinator, Community Health Programs
email: shday@ag.arizona.edu



- Dr. Linda Larkey, Phoenix Area Director, Women's Cancer Prevention Research Initiative and Research Assistant Professor, College of Public Health
- Program Coordinator voicemail, 602-470-8086, ext. 316, email: bones@ag.arizona.edu
- Elizabeth Schnoll, Health Educator, 602-470-8086, ext. 324, email: eschnoll@ag.arizona.edu

If you have questions concerning access, wish to request a sign language interpreter or accommodations for a disability, please contact Sharon Hoelscher Day at shday@cals.arizona.edu or 602-470-8086, ext. 332.