

Bone & Joint Health for Women Today

Take a step. Now take another step. Now do a knee bend. Now bend over and try to touch your toes. With just those four simple movements, you have used numerous bones and joints, as well as the cartilage and ligaments that connect them to one another, enabling movement. Every day you call upon these important body parts thousands of times as you walk, run, rise, sit, stretch, carry, dance, swim and just plain move.

Yet you probably don't think much about your skeletal system until something happens: a twisted knee from chasing your toddler around the park; a fractured wrist that time you tried snowboarding; a sprained ankle when you missed that step on the porch; a sore back after moving furniture. The reality, however, is that Americans make more than 12.8 million visits a year to doctors for back pain and 12.3 million for knee pain. In 2006, orthopedic surgeons replaced more than 542,000 knees—63 percent of them in women—and 231,000 hips, 56 percent of them in women.¹ At the same time, 10 million Americans, 80 percent of them women, have osteoporosis, a bone disease that puts them at a very high risk of fractures, while 55 percent of Americans aged 50 and older are at risk of the disease.² Meanwhile, 27 million Americans have osteoarthritis, the most common form of arthritis.³

The thing is, when your bones, joints, ligaments and other skeletal structures begin to go, it triggers a chain reaction that starts with less exercise and movement and ends with muscle loss, weight gain, social and physical isolation, depression and a plethora of chronic conditions that can significantly affect your quality of life.

The good news? Today we have a much greater understanding of skeletal-related diseases and prevention. For those of us who already experience the aches and pains of a well-used body—or even a sudden sports injury—improved surgical and nonsurgical treatments can not only restore movement, but also restore the joy of an active, involved life no matter what your age.

Oh, My Aching Knees!

When Margaret Blohm received a message about being interviewed for this article, she was sitting in the waiting room in a Dearborn, MI, hospital waiting for her 87-year-old mother's knee replacement surgery to be completed.

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Bone Health Terms to Know

- **Joint:** A connection between two bones.
- **Synovial joint:** A connection between two bones lined with a membrane and filled with fluid to lubricate and cushion the joint. The knee, shoulder, hip and elbow are examples of synovial joints.
- **Tendon:** Connective tissue that joins muscle to bone.
- **Ligament:** Elastic band of tissue that connects bones and stabilizes and strengthens joints.
- **Bursa:** A fluid-filled sac designed to reduce the friction between tendons and ligaments and tendons and bone.

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All her mother wanted, Ms. Blohm said, was to be able to play Wii bowling again in the retirement community where she lived. Ms. Blohm knew well what her mother was undergoing: The 60-year-old public relations executive had had both her knees replaced just four years previously.

Before her surgery, she couldn't even stand up straight. The pain in her knees also prevented her from walking long distances. "Even grocery shopping was a pain," she recalls. The pain interrupted her sleep and made concentration difficult. Visits to a rheumatologist led to fluid being drained from her knees, and one to a podiatrist resulted in a recommendation for orthotics. Nothing helped. Finally, Ms. Blohm referred herself to an orthopedic surgeon who x-rayed her knees and saw that the cartilage in each was gone. Her pain was caused by the grinding of bone on bone. The recommendation? A new knee.

Ms. Blohm stayed in the hospital for three days after the surgery. She began physical therapy immediately with a physical therapist and a continuous passive motion machine that moved her leg for her. By the time she left the hospital, she could go up and down three steps with a walker (the number of steps required to enter her home). A week after surgery, Ms. Blohm walked up and down the flight of stairs leading to her home office. Three weeks later, she drove herself to physical therapy.

Since then, Ms. Blohm has begun working out with a personal trainer to build strength in her legs and lose weight. She exercises regularly on a stationary bicycle and elliptical machine, uses free weights and walks up to two miles around her neighborhood.

And her mother? Turns out that surgery also went well. "The only problem," said Ms. Blohm, "is going

through airport security" because the metal replacements in the women's knees can set off the alarm.

What Ms. Blohm and her mother show so well is that you're never too old—or too young—for knee replacement surgery.

"For the majority of patients, (knee replacement surgery) works great," says orthopedic surgeon David G. Lewallen, MD, of the Mayo Clinic in Rochester, MN. "Some of my elderly patients come in saying 'I'm too old to do this.'" But I say, "I don't care what the calendar says, it's what the doctor says." In fact, the median age for arthroplasty (another word for total joint replacement) in this country is mid-60s; so half the patients are younger and half older, Dr. Lewallen noted. He's had patients in their 50s whom he turned down for surgery because of other medical problems and patients in their 90s on whom he was happy to operate. Knee arthroplasty is generally not recommended for people whose X-rays look relatively normal, those who have problems with blood circulation or people with neurologic conditions that affect the legs, he said.⁴

Studies find that total knee or hip replacement is cost effective, reducing overall health care costs as well as pain, disability and costs directly attributed to arthritis in people 65 and older.^{5,6}

No wonder that knee and hip replacement are ranked among the top three operations valued by patients (the third is cataract surgery). It's because of the impact these surgeries have on quality of life. "If you can see again, it's a very big deal," said Dr. Lewallen. "If you can't walk or have difficulty walking around the house, you walk shorter and shorter distances. Then someone does a procedure and within a few weeks you get back to walking without pain—it's a life-

changing experience.” It can also mean the difference between living independently or going into a nursing home. “We keep them going,” Dr. Lewallen said. “That’s our job.”

These days, he has more tools with which to do his job, including custom-fitted knees designed to mimic the pre-arthritic knee and robotic surgery techniques designed to provide more precise alignment.

Of course, as with any surgery, arthroplasty carries risks. In addition to the typical surgical risks of anesthesia, bleeding or infection, one of the greatest risks of arthroplasty is blood clots, or deep vein thrombosis (DVT). The clots can cut off the blood supply in the affected limb and increase the risk of infection, but the greatest risk is that a clot might travel to the lungs causing a life-threatening pulmonary embolism. That’s why nearly all patients undergoing arthroplasty should receive prophylactic treatment with blood thinners like heparin and warfarin (Coumadin) after the surgery and, in many instances, for weeks or even months after discharge. Studies find this slashes the risk of DVT and complications up to 60 percent in people undergoing orthopedic surgery.⁷

Other potential complications include problems with the artificial joint itself that may require replacement.⁸ Overall, however, the risks of either procedure are relatively low and the long-term outcomes excellent. Keep in mind, however, that if you have this done while you’re relatively young, you may need another replacement down the road.^{9,10}

Hip Resurfacing

In recent years an alternative to hip replacement surgery called hip resurfacing has become more common. The procedures are similar, only less thigh bone is removed in resurfacing. However, this requires that the bone remain strong for years—which becomes a problem once women pass menopause and their bones weaken. That may be the reason studies find much higher complication rates in the first year than with hip replacement, particularly in women and in men older than 55.¹¹

Before turning to any surgical procedure, however, make sure you’ve tried other, nonsurgical options, such as losing weight, using a cane, undergoing physical therapy and taking pain medications.

Bad to the Bone: Osteoporosis

Dolores “Dee” Rudolph knew she had a high risk of developing osteoporosis because her mother had a severe form of the bone-weakening disease, and family history is a risk factor for osteoporosis. So decades ago the now-78-year-old woman asked her mother’s orthopedist what she could do to protect herself. “Do you eat a cube of cheese each day?” he asked her. “Sure,” she replied. “I eat more than that!” “Then don’t worry,” he said.

So she didn’t, until she began developing a curve to her spine and a hump on her back. She was 58 when she was diagnosed with osteoporosis. Her treatment? Calcium supplements. Luckily, just a few years later the first pharmaceutical drugs for osteoporosis came on the market, and Ms. Rudolph started on one of them. The medication halted the bone loss, she said, although it didn’t improve it. Nonetheless, in the past three years Ms. Rudolph

broke her hip and leg after slipping on ice and her shoulder and arm after losing her balance in her house. Today, she takes an herbal/vitamin supplement high in vitamin D and receives an annual, 15-minute infusion of zoledronic acid (Reclast), which studies show significantly reduces the risk of fractures while increasing bone density.

Doctors didn’t have any osteoporosis medications when Ms. Rudolph’s mother was alive, or even when Ms. Rudolph herself was diagnosed. In fact, they didn’t even understand the importance of vitamin D to bone. (Hint: it’s *as* important if not *more* important than calcium when it comes to building and maintaining strong bones.)

Unfortunately, even though there are now six FDA-approved medications for osteoporosis, many orthopedic surgeons still think nothing can be done once a woman (or man) breaks her hip or other bone. Indeed, studies show that just one in five people who suffers a hip or other osteoporosis-related fracture receives treatment for osteoporosis.¹²⁻¹⁴ Yet nearly a fourth of the 325,000 patients who fracture their hips every year end up in nursing homes, while half never regain their previous level of activity and independence and a quarter die within a year of their fractures. In fact, the rate of death from osteoporosis-related fractures is higher than rates for breast and cervical cancer combined.

That’s inexcusable, say experts like Richard M. Dell, MD. Dr. Dell led a team at Kaiser

Studies find that total knee or hip replacement is cost effective, reducing overall health care costs as well as pain, disability and costs directly attributed to arthritis in people 65 and older.

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The bone you build during childhood and into your 30s will form the deposit from which the withdrawals come as you age and lose estrogen, a hormone that is critical to maintaining strong bone.

Permanente in Southern California that showed the risk of hip fracture could be slashed nearly 40 percent simply by instituting protocols designed to get doctors to assess and treat patients at high risk of osteoporosis, educating patients about the disease and making home visits to some patients to reduce the risk of falls.¹⁵ In one year, Kaiser's Healthy Bones Program prevented 935 hip fractures, saving the system nearly \$31 million. Similar programs have slashed fracture rates by as much as half.¹⁶

"Most people only think of osteoporosis and fractures in the elderly," Dr. Dell said. "But the disease can start in women who are in their 50s." That's when women start breaking their wrists and having vertebral fractures, which they may not even notice until they begin shrinking. "We need to start at a younger age to make people aware of the importance of bone strength and begin

treating more aggressively with (medication) in older people," he said.

The first line of medical treatment for osteoporosis is a selective estrogen receptor (SERM), such as raloxifene (Evista), or the bisphosphonates ibandronate (Boniva), risedronate (Actonel) and alendronate (Fosamax; also available generically). More serious cases of bone loss warrant more serious treatments, such as the annual infusion with Reclast like Ms. Rudolph received, or daily injections for two years of teriparatide (Forteo). However, although all the approved drugs show some benefit, the benefits may vary in individuals.

Still, prevention is key, says Dr. Dell. "Your bones are like a bank," he explains. The bone you build during childhood and into your 30s will form the deposit from which the withdrawals come as you age and lose estrogen, a hormone that is critical

to maintaining strong bone. In fact, women can lose up to 20 percent of their bone following menopause. For more on strategies you can take to build and maintain bone, see the Lifestyle Corner column on page 8.✕

Resources

American Academy of Orthopedic Surgeons
www.orthoinfo.aaos.org

American College of Sports Medicine
www.acsm.org
317-637-9200

Foundation for Osteoporosis Research and Education (FORE)
www.fore.org
888-266-3015

Know My Bones
www.KnowMyBones.com

National Institutes of Health's Osteoporosis and Related Bone Diseases National Resource Center
www.osteo.org
800-624-2663

National Osteoporosis Foundation
www.nof.org
800-231-4222

DEXA and FRAX

There are two acronyms you should know about when it comes to osteoporosis: DEXA, which stands for "Dual Energy X-ray Absorptiometry," and FRAX, which stands for "Fracture Risk Assessment Tool." The DEXA is used to assess bone-mineral density in your hip, spine and total body. Results are usually expressed as T-scores, a measure of how far your bone density deviates from the average bone density value for a young, healthy, Caucasian woman. A T-score between +1 and -1 indicates normal bone density while a score at or below -2.5 usually signals osteoporosis. A T-score between -1 and -2.5 usually signals osteopenia, or low bone density, that should be evaluated. The bone density is also compared to what is considered normal for your age, sex and size.

Meanwhile, the FRAX score, which is based on your age, weight, height, medical history and other risk factors, as well as your bone mineral density score, determines your risk of having a hip or vertebral fracture in the next 10 years.

Women with no risk factors for osteoporosis who have never smoked or had a fracture can wait until age 65 for their first DEXA scan, says Richard Dell, MD. Other women may need a scan earlier. A combination of a hip bone density score between -1.0 and -2.5 and a 3 percent or higher risk of hip fracture on the FRAX, or a 20 percent or higher risk score on the FRAX, should trigger medical treatment. Otherwise, says Dr. Dell, 1,000 to 1,200 mg a day of calcium and 1,000 IU of vitamin D supplements coupled with weight-bearing exercise should provide enough protection for the time being.

Alternative Options for Bone & Joint Pain

While nonsteroidal pain relievers (Ibuprofen [Motrin], among others) and acetaminophen (Tylenol) can definitely help with the pain of osteoarthritis, they each carry significant side effects: gastrointestinal bleeding and possible cardiovascular problems with nonsteroidal anti-inflammatories and liver toxicity with acetaminophen.

So millions of people turn to alternatives to relieve the pain of arthritis and restore function to aching knees and hips. Among the options with some evidence behind them:

Glucosamine/chondroitin.

Glucosamine and chondroitin are substances found in and around cartilage cells. The evidence on their use as dietary supplements for osteoarthritis is mixed. A large government study called GAIT (Glucosamine/chondroitin Arthritis Intervention Trial) compared the supplements alone or together to celecoxib (Celebrex) in 1,229 participants with mild pain from knee arthritis and 354 with more severe pain. The trial found that while 1,500 grams a day of glucosamine and 1,200 mg a day of chondroitin alone or together did not improve pain in the group at large any better than a placebo, it did have a significant benefit in people whose pain was more severe.¹⁷ Meanwhile, a review of studies found a much greater benefit from the Dona brand of glucosamine than any other.¹⁸

Methylsulfonylmethane (MSM).

One study found that 500 mg three times a day of this dietary supplement significantly reduced

pain and improved function in people with osteoarthritis.¹⁹ In another study, three grams of MSM twice a day worked better than placebo in reducing pain and improving function.²⁰

S-Adenosyl methandienone (SAME).

A review of 11 studies involving 1,442 people with osteoarthritis found that SAME, a synthetic form of an amino acid and energy-producing compound in your body, worked just as well as nonsteroidal anti-inflammatories at reducing pain with fewer side effects.²¹

Acupuncture. A review of five well-designed, randomized clinical trials involving 1,334 people with pain from osteoarthritis found that real acupuncture was significantly better than “sham” acupuncture in improving objective measurements of pain and function.²²

Tai chi. Several studies find that this ancient Oriental meditative exercise can help reduce pain and improve function in people with osteoarthritis, sometimes even better than typical treatment.²³ As always, tell your health care professional about any supplements you take or want to try and about any new exercise regimens you begin. ✕

What About Back Pain?

Lower back pain is one of the most common reasons people visit their health care professionals. While anti-inflammatories and pain relievers can help some, nonmedical options abound. One of the most commonly used is massage—for good reason. Eight studies comparing massage to other treatments for low back pain such as exercise, bracing, relaxation therapy, physical therapy, acupuncture and self-care showed that massage definitely has benefits for low back pain, particularly when combined with exercise and education about preventing further back injuries. Acupressure massage and Thai massage, two special types, were most effective.²⁴

Meanwhile, a review by the American Pain Society and the American College of Physicians found “good evidence” that cognitive-behavioral therapy, exercise, spinal manipulation (chiropractic) and interdisciplinary rehabilitation involving aspects of several approaches were all moderately effective for back pain that has lasted more than four weeks. They also found “fair evidence” that acupuncture, massage, yoga and a form of physical therapy called “functional restoration” also worked. Meanwhile, heat applied to the painful area and spinal manipulation were effective for acute back pain, or pain lasting less than four weeks.²⁵

Millions of people turn to alternatives to relieve the pain of arthritis and restore function to aching knees and hips.

Girls & Sport Injuries

Many women today never had the sports-related opportunities their daughters and nieces now have because when they were growing up, sports were for boys.

That changed in 1972 when Title IX, a federal law that mandated equal opportunity in sports, passed. Since then, girls' participation in high school sports has soared nearly 80 percent. Unfortunately, so have athletic-related injuries in girls.²⁶

“We know girls are being exposed to organized sports at an earlier age and to an increased amount of those sports,” says R. Dawn Comstock, PhD, at the Center for Injury Research and Policy at Nationwide Children's Hospital in Columbus, OH, who tracks athletic injuries. Combine the earlier exposure and increased number of exposures

with the more intense competitive atmosphere in kids' sports today and you have a perfect storm for serious injuries that may not only end an athlete's career before it begins but may also lead to major surgeries like knee replacements before age 35.

Now, the last thing Dr. Comstock wants to do is scare parents away from getting their kids involved in sports, particularly given the epidemic of child and adolescent obesity in this country. But the reality, she notes, is that “any time a kid is active they are at risk of injury.”

And, it appears, girls who are active in organized sports have a far higher risk of severe injuries than boys playing the same sports. For instance, Dr. Comstock's work shows that high school girl basketball players are 43 percent more likely to be injured than their male counterparts. All together, girls who play soccer, basketball or baseball/softball are 28 percent more likely overall to become injured compared to boys who play the same sports.²⁷ While boys are more likely to sustain injuries resulting from player-to-player contact, like con-

ussions, girls are more likely to become injured without any contact.

Dr. Comstock's work also shows that nearly one-third of severe injuries overall occur in the knee. And while boys were more likely to injure their knees than girls, girls were more likely to have severe injuries requiring surgery and longer recovery times. One of the most common such injuries is a tear in the anterior cruciate ligament (ACL), the band of tissue that connects the knee to the shin bone, or femur, controlling lower leg movement and stabilizing the front-to-back movement of the knee. Female athletes are two to eight times more likely to sustain an ACL injury than boys, which can end their playing days.²⁸

Just why girls have such higher rates of ACL injuries remains a mystery. Leading theories relate the difference to hormones like estrogen that make ligaments in girls stretchier. Other possibilities include gender-related posture, hip position and hip stiffness differences, the smaller size of the female ACL, and differences in the underlying structure of the ligament.²⁹

Prevent ACL Injuries

The good news is that certain training programs can help prevent ACL injuries.³⁰ Tips R. Dawn Comstock, PhD, offers to keep your daughters (and sons) healthy while playing sports include:

- Have them undergo a full physical with your regular health care provider to make sure your child is completely healthy and ready to play the sport.
- Monitor your child's level of fatigue—not just from lack of sleep, but also muscle fatigue from overuse.
- Make sure your child remains hydrated.
- Check that protective gear fits properly and make sure it's worn.
- Evaluate the playing environment for safety.
- Make sure the coach is knowledgeable and has received training in coaching the sport and injury prevention.

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Commonly Asked Questions & Answers about Bone & Joint Health

Q I heard about a surgery I can get for the crushed vertebrae in my back. Do you recommend it?

A Vertebroplasty is used to repair fractured vertebrae by injecting bone cement into the bone to strengthen and stabilize it. However, recent studies found no difference in long-term outcomes between this surgical procedure and noninvasive treatments like medication, exercise and physical therapy, although the surgery carried greater risks.³¹⁻³³ At this point, I would probably not recommend vertebroplasty for my patients. Other options for painful vertebral fractures include calcitonin (Calcimar, Miacalcin), a hormone that can prevent further bone loss and reduce the pain; bracing; pain management approaches; and anti-osteoporosis medications.

—Richard M. Dell, MD
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Q I have been taking ibuprofen for my osteoarthritis. Now I have stomach pain. What are my options?

A Ibuprofen (Motrin, Advil) are nonsteroidal anti-inflammatory (NSAIDs). Other NSAIDs

include aspirin and naproxen (Aleve), as well as more than a dozen prescription-only medications. All have the potential to cause stomach problems ranging from mild upset to bleeding. That's why people with a history of ulcers or other gastrointestinal bleeding should only use these medicines under the close supervision of their doctor or not at all—even the over-the-counter types.

Try stopping the medication for a couple of days and see if the symptoms go away. If so, try taking your medicine with food or at a different time of the day (morning instead of evening). If you still have pain, call your health care professional. A switch to a different medication might make all the difference. One alternative that doesn't cause stomach problems is acetaminophen (Tylenol). Prescription pain medications that don't contain NSAIDs are also available.

If you have severe symptoms that persist more than a day or two, vomiting or bleeding with a bowel movement, call your health care professional immediately.

Q My doctor recommends surgery for my arthritic knee.

How successful is this procedure?

A When the normal knee is injured and the damage is limited to a tear of the meniscal cartilage located between the two surfaces of the knee joint, repair or removal of the damaged fragment of meniscus with arthroscopic surgery can produce dramatic results and often allows return to normal activities.

The outcome is very different and much less predictable when problems occur in a joint that has been gradually wearing out for many years, which is more typical with osteoarthritis. Then, arthroscopic treatment is very often disappointing. If it helps at all, benefits are often short lived. For this reason, most surgeons offer arthroscopy in arthritic knees only if there are obvious mechanical symptoms such as occasional locking.

—David G. Lewallen, MD
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What You Can Do to Improve Your Bone Health

By now you've read about the various treatments available for arthritis, osteoporosis and various joint problems. How about preventing the damage and pain in the first place?

Here are some ways to get started.

- **Work on those quads.** A recent study found while stronger thighs won't prevent osteoarthritis of the knees, it can reduce the amount of pain or stiffness with knee osteoarthritis.³⁴ Squats and lunges, as well as certain exercises with weights, can help strengthen quadriceps.
- **Get your omega-3 fatty acids.** Our diets today have gotten out of balance when it comes to omega-3 versus omega-6 fatty acids. The former are primarily found in fatty fish and some nuts and seeds, such as flaxseeds. The latter are found in many vegetables, such as corn and corn oil. While the anti-inflammatory benefits of omega-3 fatty acids (think fish oil supplements) is well known, less known is the

fact that your intake of these fats can affect both bone formation and the rate at which bone is broken down. One study of 1,532 people between the ages of 45 and 90 found that the more omega-3 fatty acids they consumed and the fewer omega fatty-6 acids, the better their bone mineral density at the hip.³⁵ While eating a fatty fish like salmon twice a week is a good way to go, you can also swallow a couple of fish oil supplements every morning.

- **Dig some D.** Vitamin D, the so-called "sunshine" vitamin, helps your body absorb calcium and maintain enough calcium and phosphate in your blood so it doesn't get pulled out of bone. It also enables bone growth and the breaking down and building up of bone. Low levels of vitamin D not only contribute to osteoporosis, but also a condition called osteomalacia, in which you feel an aching pain in your bone even as the bone weakens. Low vitamin D also causes muscle weakness, which can lead to falls and fractures in older people. The best source of D is sunlight, but it's nearly impossible to get enough in the fall and winter or if you're using sunscreen. That's why supplements are your best bet. Most experts

recommend supplementing with at least 1,000 IU of vitamin D a day.

Having said all that, you still need the calcium—1,200 mg a day is recommended for most women. Don't skip it even if you're already taking medication for osteoporosis. You still need both calcium and vitamin D supplements to get maximum results from the medicine. Take the calcium in divided doses of 500 or 600 mg a day.

- **Quit smoking.** Women who smoke tend to have lower bone density and higher risk of fractures than women who don't, possibly related to lower calcium absorption and production of estradiol.
- **Hit the road.** As with nearly any chronic disease, exercise reduces your risk of osteoporosis and arthritis. By strengthening muscle and aiding in weight loss, exercise can reduce the strain on joints. Weight-bearing exercise such as walking also helps maintain bone density—no matter what your age. Keep it low-key, however; the pounding of running and other high-intensity exercise can damage joints and ligaments, leading to inflammation, pain and, eventually, arthritis.✕



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Antidepressants and Osteoporosis

If you are postmenopausal and have been taking a selective serotonin reuptake inhibitor (SSRI) antidepressant such as fluoxetine (Prozac), paroxetine (Paxil) or sertraline (Zoloft) daily for several months or years, ask your doctor to check your bone density. Recent studies find a substantial increased risk of osteoporosis in women who take daily SSRIs, regardless of other risk factors.³⁶

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