Fitness guru and newspaper columnist Tina Aboitiz Juan based her presentation on the following series of articles, which she wrote for *Philippine Daily Inquirer*.

**Bones need more than calcium (Feb. 20, 2007)**

Calcium is like the lead singer of a band who has gotten more publicity than she deserves. An over-hyped diva, she only sounds fantastic because of her back-up singers and other band members.

When it comes to bone health and osteoporosis, scientists now know that calcium does not operate alone. It needs the help of a supporting cast of nutrients to be effectively absorbed and utilized. These other nutrients also have their own unique influence on keeping bones healthy.

The recommended dosages of calcium are 1,000 to 1,200 mg for women below 50 and 1,500 mg for women above 50. The best sources are milk, cheese, yogurt, small fish, dark green vegetables, and mineral water.

If you can’t get enough calcium from your food, then you have to take a supplement. To know if your calcium tablet will be properly absorbed, place it in a small amount of warm water for thirty minutes and stir occasionally. If it doesn’t dissolve by then, it’s not a good brand.

Whether from food or supplements, calcium is best used by the body in doses of 500 mg or less so take your daily requirement in two or three separate doses.

**Sunshine vitamin**

Vitamin D has been called the “sunshine vitamin” because your body can make its own supply by using the power of the sun. It has also been called the “miracle vitamin” because emerging research indicates it can lower the risk of sixteen types of cancer by 2% to 70%.

The National Osteoporosis Foundation (US) states that without an adequate intake of vitamin D, half the calcium you take ends up flushed away in your toilet.

Fifteen minutes of sun exposure on your hands and face is enough for your daily dose.

The problem is many people don’t want to go out in the sun because they are afraid of premature skin aging and skin cancer. Also, the older you get, the more inefficient your body becomes at making vitamin D.

How much do you need? Some scientists maintain that the current recommended dosage of 400 IU is enough (200 IU for children, 600 IU if you are above 60) but others are suggesting that 800 IU to 1,000 IU daily for adults (2,000 IU during winter) is more accurate based on growing evidence from many studies.

Food sources include fortified milk and cereals (not all are fortified with vitamin D so read the labels carefully), salmon, mackerel, and egg yolks.

The most effective form of vitamin D in supplements is cholicalciferal or vitamin D3, which is the same type your skin makes.

**B for bones**

What’s bad for your heart may also be bad for your bones. High levels of homocysteine are associated with an increased risk of heart disease and hip fractures. Dutch scientists believe that the blood protein may hamper bone construction. The best line of defense, the researchers say, is an adequate intake of folic acid (400 mcg), B6 (2 mg), and B12 (6 mcg), which can be found in many foods and multi-vitamin supplements.

A Tufts University study found that women with low levels of vitamin B12 (less than 6 mcg) had less dense spines, while men had less dense hipbones. Researchers say people above 50 absorb the vitamin better in concentrated form from a multivitamin rather than food sources.

Folic acid or folate can be found in dark green vegetables, grains, liver, and beans. B6 is found in beans, nuts, legumes, eggs, meat, fish, and whole grains, while B12 is only found naturally in animal products like meat, fish, poultry, eggs, and milk.

**Vitamin K**

Vitamin K is best known for its clotting effect. But it is also important in keeping the “scaffolding” in the inner structure of your bones strong.

The current recommended dose is 90 to 150 mcg. Scientists stress it is best to get vitamin K from food sources only. It is easily found in dark green leafy vegetables. Since it is a fat-soluble vitamin, sautéing pechay or kangkong in a little oil or eating dark salad greens with a vinegar-and-oil dressing ensures that you will properly absorb this important vitamin.

**Boron**

This little known mineral helps to reduce the loss of calcium and magnesium in the urine. It is found in vegetables (cabbage has the highest amounts), nuts, grains, apples, pears, and dried fruits.

**Magnesium**

Magnesium, like calcium, helps to provide density to your bones. One study found it played a greater role than calcium in preventing hip fractures in elderly women.

The recommended dose is 400 mg. One of the richest sources is pumpkin seeds (one ounce has 151 mg). It can also be found in bran, nuts, beans, brown rice, dark green vegetables, and soy products. Unfortunately, overcooking can destroy a significant amount of magnesium in beans and vegetables.

**Potassium**

Potassium is the partner of vitamin K in strengthening bone scaffolding. It also prevents calcium loss. You can get the suggested dosage of 4,700 mg from orange juice, raisins, prunes, bananas, cantaloupes, avocado, fish, and milk.

**Extras**

Isoflavones in soy products may be one reason why Chinese and Japanese women have less osteoporosis than their Caucasian counterparts.

Just one cup of pineapple contains 73% of your daily requirement for manganese, a bone builder in young people and a bone strengthener in older people.

Fluoride, flavonoids, and phytoestrogens in green tea help to preserve bone density. One study indicates it’s not the amount of tea but how long you have been drinking it that matters.

*Sources:*

*National Osteoporosis Foundation*

*The World’s Healthiest Foods*

*Prevention Magazine*

*Next week: The Bone Robbers*

*Visit* [*www.tinajuanfitness.info*](http://www.tinajuanfitness.info)

**The Bone Robbers (Feb. 27, 2007)**

**Part One**

Bones are in a constant state of building up and breaking down. Every year, 20% to 30% of an adult skeleton is “new”. When you are young, there is more bone building than there is bone breakdown. That’s why childhood is the time to build bone strength.

Until the age of 40, both phases are more or less equal, assuming you are not doing anything abusive to your bones. After 40, the breaking down begins to gradually exceed the building up. This happens to everyone, men and women alike, in varying degrees. Women, however, experience a more rapid loss of bone after menopause because of declining estrogen levels.

Everyone’s goal should be to slow down the natural aging of bones and not hasten it with poor lifestyle habits or “bone robbers”.

“A high calcium intake will not protect a person against bone loss caused by estrogen deficiency, physical inactivity, smoking, alcohol abuse and various medical disorders and treatments”, according to the National Osteoporosis Foundation.

**Physical inactivity**

When people undergo prolonged bed rest or immobilization, they lose bone. The same happens to astronauts who fly long missions in the weightlessness of outer space. Bones need the “stress” of physical activity to stay healthy.

In a 10-year Penn State University study on Caucasian girls from ages 12 to 22, exercise had a more significant impact in building bone than calcium intake.

It doesn’t pay to be a couch potato at any age. In a Tufts University study, postmenopausal women who were not on hormone replacement therapy did strength training for one year. They increased bone density by 1% while the sedentary control group lost 2% of their bone density.

Men usually lose bone at a slower rate than women because they start out with a higher bone mass and do not undergo menopause. But if they lead “senorito” lives, they can be at a higher risk of fractures than women as seen in a study of a rural Turkish village with the tradition of letting women do all the hard physical work.

**Smoking**

The National Institutes of Health state that the longer you smoke and the more cigarettes you consume, the greater your risk of fracture in old age. Both men and women who smoke have significant bone loss when they get older.

Exactly why smoking affects bones in not clear. It could be due to smoking itself or because smokers tend to have other risk factors like alcohol abuse, less physical activity, and poor diets. Also women smokers tend to produce less estrogen and experience early menopause, both of which accelerate bone loss.

**Alcohol**

Excessive alcohol consumption is associated with low bone density and a higher risk of fractures, according to studies on alcoholics. Moderate alcohol intake, meanwhile, is associated with higher bone density in postmenopausal women. Researchers believe alcohol increases estrogen levels. Unfortunately, this also increases the risk of breast cancer.

**Dieting**

Dieting may be good for your figure but it isn’t good for your bones. A Rutgers University study found that just six months of dieting decreased bone density by 3%. The researchers say that losing weight could cause a change in three hormones (parathyroid, estrogen, and cortisol) that affect the absorption and utilization of calcium.

However, the results of a Washington University study shows that although losing weight through diet alone causes bone loss, losing weight by exercising does not.

The diet only group ate 16% fewer calories for three months and 20% for nine months. The exercise only group did not reduce calories but increased energy expenditure through exercise by 16% for three months and 20% for nine months.

The diet only group lost more weight (18.1 pounds compared to 14.8 pounds) but they also lost more bone – an average of 2.2% at the lower spine, hip, and top of the thighbone. The exercise only group did not lose any bone.

So if you need to lose weight, don’t just diet. Make sure to include weight bearing, impact, and muscle strengthening exercises to protect your bones.

Severe restriction of calories (chronic crash dieting, anorexia nervosa, bulimia) has a very negative effect on bones because of the hormonal imbalances dieting produces.

So does a condition called “Female Athlete Triad”, in which athletes are not getting enough calories for the rigorous training they undergo and menstrual periods stop.

The sad part is that bone loss in young women can be irreversible. In a 1997 study, female athletes with eating disorders and menstrual abnormalities did not have normal bone mass density four years after their menses returned and in spite of undergoing estrogen hormone therapy and calcium supplementation.

Very thin women are at a greater risk of osteoporosis than women of normal weight. One scientist has even proposed there might be a good reason why menopausal women put on a little extra weight even if they exercise and watch their diet. Estrogen isn’t just made in the ovaries. It is can also be synthesized by fat tissue. Perhaps that small padding of fat is Nature’s way of protecting your bones.

*Sources:*

*National Osteoporosis Foundation*

*National Institutes of Health – Osteoporosis & Related Bone Diseases*

*Well-Connected Reports, Nidus Information Services*

*Visit* [*www.tinajuanfitness.info*](http://www.tinajuanfitness.info)*.*

**The Bone Robbers (March 6, 2007)**

**Part Two**

Keeping your bones strong as you age is not as easy as popping calcium supplements and drinking milk. There are potential “bone robbers” that may be lurking in your lifestyle.

**Medications**

Too much pre-formed Vitamin A (which is not the same as beta-carotene) increases the risk of fractures. The Harvard School of Public Health advises against supplements with 5,000 units of pre-formed vitamin A unless prescribed by your doctor because many foods are already fortified with vitamin A. Beta-carotene does not increase the risk of fractures.

Long-term use of corticosteroids can lower bone mass density. Other medications like anticonvulsants, thyroid medicines, certain diuretics and blood thinners can cause bone loss or deficiencies in calcium and/or vitamin D.

**Colas**

A 2006 Tufts University study found that elderly women (average age a little below 60) who drank four 12-ounce colas (regular or diet) a week for four years had 4% lower bone density than women who drank less than one cola a week. Men were not affected and neither were women who drank other types of soft drinks.

The low bone density findings were the same regardless of age, menopause, calcium and vitamin D intake, and smoking or drinking habits.

The researchers suspect either caffeine or phosphoric acid in colas might be to blame. Caffeine increases calcium loss in the urine while phosphoric acid can leach calcium from bones.

Phosphorus is a mineral that the body uses together with calcium to make bones. Some studies show that a high-phosphorus intake is only harmful to bones if the diet is deficient in calcium. Phosphorus isn’t just found in sodas. It is also in white flour products, processed meats, instant soups, and some breakfast cereals.

**Protein**

Protein doesn’t just build muscle. It is also an integral part of bones in the form of collagen. Research suggests that very low-protein and very high-protein diets can be harmful to bones.

But how much protein is too much? Is vegetable protein better than animal protein? Currently, the studies are conflicting.

**Pro-meat**

2003 Creighton University: Elderly women (65 to 77) with the highest intake of protein (72 grams of protein per day and 408 mg of calcium) had higher bone density in the spine and total body but not the hip. A 1974 study of young men found similar results. A higher protein diet increased calcium absorption but only if calcium intake was above 500 mg a day.

1999 Utah State University: A lower risk of hip fracture among older women and women (50 to 69) was associated with a higher intake of animal protein compared to those taking vegetable protein.

**Anti-meat**

2001 University of California, San Francisco: Elderly women who ate a meat-rich diet had lower bone density in the hip and greater risk of hip fractures than those who got their protein from vegetable sources.

1996 Harvard School of Public Health: Women who ate red meat five times a week had a higher risk of forearm fracture than women who ate red meat less than once a week. Women who ate more than 95 grams of protein per day also had a higher risk of forearm fracture than women who ate less than 68 grams per day. The increase in risk was associated with animal protein but not with vegetable protein.

**Vegan warning**

1997 Kaohsiung College, Taiwan: Post-menopausal Buddhist nuns who followed a strict vegan diet (absolutely no animal products) for many years were found to have a higher risk of lumbar spine fractures. The nuns’ diet may have been deficient in vitamin B12, which is only found from animal sources.

A Tufts University study found that women with low levels of vitamin B12 (less than 6 mcg) had less dense spines, while men had less dense hipbones. Nutritionists usually recommend B12 supplements for vegans.

**Salt**

A 2005 Purdue University study discovered that black and white young females absorb and assimilate salt and calcium differently. This may explain why blacks have a higher rate of hypertension but a lower rate of osteoporosis. The opposite is true for whites. However, the study uncovered that “too much salt reduces bone density in both races”.

According to a 1995 Australian study on post-menopausal women, the higher the sodium intake, the greater the loss of bone density in the hips. Sodium is present in many processed foods even those that don’t taste salty.

A review of other studies indicates that reducing salt intake and increasing potassium in the diet helps to reduce bone loss. Potassium is found in bananas, tomato and orange juice, melons, potatoes, and spinach.

**Depression**

Here’s something to really be depressed about. A study found that pre-menopausal women with major clinical depression had low bone density comparable to that of postmenopausal women. Another study found that women with past or current depression had lower bone density than women without depression. There is speculation that the stress hormone cortisol might be involved.

**Milk**

Anti-milk activists claim that a high intake of milk is a major cause of osteoporosis. This is a highly controversial issue. If ever proven true, it would be most ironic considering the aggressive milk moustache campaigns.

At the heart of the debate is the observation that countries with the highest dairy intake have the highest osteoporosis rates.

However, much more research is needed before any conclusion can be drawn. There are just too many other factors that affect bone health like vitamin D, magnesium, and physical lifestyle.

*Sources:*

*National Osteoporosis Foundation*

*National Institutes of Health – Osteoporosis & Related Bone Diseases*

*Well-Connected Reports, Nidus Information Services*

*Note: “Pinay in Action” will hold a 5K & 10K fun run to be led by Senator Pia Cayetano on March 18 in celebration of Women’s Month. Call 0297-404-5187.*

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**The Best Exercises for Strong Bones (March 13, 2007)**

It is a sad reality that as you grow older you will lose bone. It happens to everyone to some degree. Older athletes or older people who are active will still have less bone than their younger counterparts.

But even though exercise can only slow down bone loss, you will still be way ahead of the game if you stay physically active. Without regular exercise, muscles and bones weaken at a much faster pace.

Muscle weakness leads to a sedentary lifestyle, which leads to a loss of balance and coordination and an increased rate of bone loss, which leads to falling down, which leads to complications from immobility, which can lead to premature death.

A physically active lifestyle prevents this downward spiral. Strong muscles help you maintain good balance and prevent falls.

**Childhood**

Osteoporosis has been called “a childhood disease with old age consequences”. The strength of your bones is determined mostly by how active you were as a child.

A 1988 study found that post-menopausal women who were active between the ages of 14 and 21 had a higher bone density than women who were not as active.

British researchers found that daily vigorous exercise (20 to 40 minutes) and a daily calcium intake of 700 to 800 mg was the best formula for building bones in children. “Vigorous” exercise was defined as the normal playground activities and sports that children engage in.

Other studies have shown that stop-and-go multi-directional sports like soccer and basketball are useful for improving bone density in children. Jumping has also been shown to be effective for young girls and young women.

A 10-year Penn State University study determined that exercise had a more significant impact on building bone than calcium intake for girls ages 12 to 22.

**Weight bearing**

Bones need to be challenged or “stressed” with an appropriate amount of force to become denser and stronger. And even though the best time to build bone is during childhood, exercise plays a role in slowing down the rate at which you lose bone as you get older.

Current research indicates that weight-bearing exercises are the best for bone strengthening. There are two categories – resistance training and impact exercise.

When muscles pull bones against resistance, the bones are stimulated and respond by becoming stronger. Resistance can come in the form of free weights (dumbbells and barbells), strength machines, cables, springs or rubber bands, water (aqua exercise), and body weight (chin-ups, push-ups, yoga, wall climbing, stair climbing).

Walking, running, hiking, skipping rope, dancing, and aerobic classes are examples of impact exercise. Your bones are stimulated by the impact of every step you take while carrying your body weight. Racquet sports and boxing are impact sports for the upper body as well.

**Site-specific**

The bone strengthening benefits of exercise are site-specific. Only the specific areas where muscles tug at bones or where weight-bearing impact is applied will get stronger. In sports where one limb is used more than the other, the weight-loaded extremity has a higher bone density than the other one.

Lower body exercises like squats and lunges will make the leg and hipbones stronger but not so much the spine. People who lift weights for the upper body have spines that are 10% denser than runners.

This means that you need to cross train or do a variety of exercises to get the full benefits of bone strengthening.

**Weight training**

A 2003 study suggests that postmenopausal women will have greater gains in bone density if they do weight lifting exercises like the bicep curl, lat pulldown, and military press in a standing rather than sitting position.

Upper body strength training with weights increased the spinal bone density of women ages 35 to 45 by 1.4% in an Oregon State University study. Women who did only lower body exercises like squats and lunges did not see any increases in spinal bone density.

In studies of young and middle-aged women, muscle strength is positively associated with higher bone densities. For older and elderly women, strength training is important because strong muscles prevent unnecessary falls.

Long-term use of immuno-suppresant drugs can lead to premature osteoporosis. It was previously believed that the bone loss was irreversible. However, a University of Florida experiment proved that some of the bone mass can be recovered through resistance training.

Two groups of lung transplant patients were put on either a walking program or a supervised resistance training program for the lower back. After six moths, there was no change in the bone mass of the walkers but the resistance training patients increased bone mass in their lumbar spine by 15%.

Sources: National Osteoporosis Foundation

American College of Sports Medicine

American Council on Exercise

Harvard School of Public Health

Mayo Clinic

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**More of the Best Exercises for Strong Bones (March 20, 2007)**

**Part Two**

Exercise plays an important role in building bone in childhood and adolescence, maintaining bone before fifty, and slowing down bone loss after fifty. But not all exercises are equal.

The best exercises are those with impact (running, sprinting, jumping) or resistance (squats, push-ups, rock climbing).

Current research indicates that non-weight bearing exercises like cycling and swimming and light impact exercise like slow walking are not enough.

**Yoga and Pilates**

There are not many yoga or Pilates bone density studies. However, knowing that resistance exercise is effective, we can logically assume that some aspects of yoga and Pilates are beneficial.

Standing yoga poses like the warrior and transitional lunges could build leg and hip bones. One-legged poses like tree improve balance. Poses like reverse plank and upward and downward dog should strengthen wrist and forearm bones.

All yoga and Pilates exercises that require lifting of the legs or upper torso in the supine or prone (face up and face down) positions may build bone density in the lumbar spine.

Additionally, Pilates machines that use the resistance of springs are similar to gym machines that use cables.

**Tai Chi**

This gentle form of exercise improves balance and leg strength. Studies have found people who do tai chi have a 50% reduced rate of falling. And when they do fall, their rate of fractures is much less. Do tai chi once or twice a week for at least 15 minutes.

**Jumping**

Skipping rope, jumping jacks, and vertical jumps are effective bone builders. Skip rope at least fifteen minutes three to five times a week. You only need two minutes a day for jumping jacks and vertical jumps. Do several 15 - 30 second jumps and rest in between.

**Racquet sports**

A Finnish study found that squash players and weight lifters had the highest bone mineral densities. Squash, tennis, and badminton are stop-and-go sports with rapid multi-directional changes – all beneficial factors for bone strengthening.

**Gardening**

Growing flowers can help build bone but only if you actually shovel, rake and weed. Telling your gardener what to do doesn’t count. A University of Arkansas study found that women older than 50 who went to the gym or who gardened had lower rates of osteoporosis.

**Rowing**

In an Oregon University study, post-menopausal women who rowed competitively for one year experienced a 6% greater increase in spine density than women who did not row but who were physically active.

**Aerobic dance**

Women who did a 45-minute step aerobics class three times a week for six months experienced a 3% increase in bone density in their spines, legs, and heels.

Researchers at Texas A&M university say that step aerobics adds the extra challenge of changes in direction and speed, which stimulate the bones even better than skipping rope and jogging that offer only impact.

A British study found that high-impact aerobics (aerobics with hops, skips, and jumps) improved the hipbone density of postmenopausal women and men over 50.

**Walking**

A Johns Hopkins Hospital study found that light intensity walking does not strengthen bones. Brisk walking delivers a higher impact than slow walking.

Brisk walking (as if you were late for an appointment) for thirty minutes four days a week can help reduce bone loss before and after menopause. A study found that women who regularly walked 7.5 miles a week lost bone at a slower rate (four to seven years longer) than women who didn’t walk.

For people already at risk for falling, lifting weights is a better and safer alternative than walking.

**Cycling**

Off-road bikers have above average bone density while street cyclists have slightly below-average bone density, according to a study published in the journal Bone. The jarring, bouncing, and vibration on rough roads is a form of stimulation that builds bone.

If street cycling or spinning is your only exercise, add weight training or impact exercise to your regimen. A 2003 study found that male cyclists (ages 40 to 60) who had been cycling 12.2 hours a week for twenty years had bones that were 10% less dense than active non-cycling men their same age. 17 of the 27 cyclists had moderate bone loss or osteopenia while four had severe bone loss or osteoporosis.

The profuse sweating of intense cycling may contribute to bone loss. There is evidence that an hour of intense endurance training can result in a loss of 200 mg of calcium. A 1996 study attributes bone thinning among college basketball players to prolific sweating.

**Swimming**

Many studies have found that swimmers have lower bone densities than athletes in weight-bearing sports and lower or similar bone densities as non-athletes. The results apply to males and females, prepubertal subjects, adolescents, and adults. That’s why swimming does not have a good reputation for increasing bone mineral density.

However, most studies used dual x-ray absorptiometry (DXA), which is a two-dimensional measure and is highly influenced by body size.

When male water polo players and weight lifters were assessed using quantitative computed tomography (QCT), both groups had similar bone densities.

Rat studies have found that swimming improves bone elasticity and structural strength- properties that can only be seen with quantitative ultrasound (QUS). Perhaps when more human studies use QUS, swimming will redeem itself and shake off its bad reputation. In the meantime, swimmers should cross train with weights or impact exercise.

Sources: National Osteoporosis Foundation

American College of Sports Medicine

American Council on Exercise

Harvard School of Public Health

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