

## ***Presentation Overview***

This step-by-step manual can be used to assist educators in developing presentations about osteoporosis and the steps that can be taken to prevent osteoporosis and its disabling fractures. This presentation can be tailored to meet the interests and needs of specific audiences.

The primary message of this presentation is the *prevention of osteoporosis and fractures through a healthy lifestyle*. The materials provided focus on nutrition, exercise and environmental safety. Some information is provided about medical prevention, diagnosis and treatment. However, educators should remind participants that the purpose of this program is to educate them about good health habits and healthy lifestyle choices in order to prevent osteoporosis. *It is important that educators emphasize to participants that this program cannot answer specific medical questions and is not intended as a substitute for medical advice from a health care professional. Only health care professionals familiar with each participant's medical history can answer specific medical questions.*

### **Organization of the Slide Presentation**

**Text:** The text of the manual provides sufficient detail on each topic and discussion of each topic should adhere to the information provided. Educators should not give medical advice or endorse any specific medical product or medication.

**Supplemental information:** This information provides further detailed information that may assist in responding to audience questions.

**Interactive Activities:** Many of the audience activities are designed to involve the participants in the learning process. Educators should decide in advance which of these activities will be incorporated into the training based on presentation style, nature of the audience and time constraints. While it will probably not be possible to utilize all of these activities, it is recommended that at least some interactive activities be included in order to maintain interest and enhance learning.

**Evaluation:** The evaluation is an important part of the educational process. It is the educator's responsibility to administer and collect the evaluation forms and submit them to the Department of Health Osteoporosis Prevention and Education Program Manager. The evaluations should be analyzed and used to improve future presentations. Use only the evaluation form provided in the educational guide. Set a positive tone for the evaluation process at the beginning of the presentation and solicit honest feedback and suggestions to help improve the presentation.

**Designing a Presentation:** The educator is responsible for designing each presentation to meet the participants' needs and to fit within the allowable time. Educators should be selective in deciding which information to present.

**Length of time:** The length of time for a presentation will vary depending on the size and type of the audience, but typically a presentation should last 45 minutes to one hour. Educators should select appropriate information and activities from the presentation to fit the amount of time allowed, adjusting the amount of time spent on various topics to fit the needs and interests of the audience. Ample time should be allowed for questions and discussion. *Always start and end on time.*

## **Presentations for Specific Populations**

This Osteoporosis Presentation is designed for a general audience. However, many presentations will attract participants with specific needs and interests, such as the elderly, ethnic organizations and social organizations. Educators should adapt their presentation to these groups. The following suggestions may be helpful in adapting a presentation to a specific audience.

**Seniors:** Many elderly have some knowledge of osteoporosis, however only a small percentage is totally informed about osteoporosis. The topics of *nutrition, exercise, lactose intolerance, environmental safety, testing and treatment* are most relevant to seniors' needs. The general information should also be presented, but in less detail than for other audiences.

**Middle-aged women:** The topics of *risk factors, nutrition, and exercise* are relevant to this group and they will most likely have concerns about the effects of *menopause and the use of estrogen or medications in the treatment of osteoporosis and preventing future bone loss*. Detailed information about treatment options and bone density testing is provided; additional time may be required for discussion.

**Younger women:** Presentations to women in their twenties and thirties should emphasize *risk factors, nutrition, exercise, maintaining and building bone*. It may be especially helpful to emphasize ways of including adequate calcium in meals and snacks. It is also important to emphasize the risks of excessive dieting and exercise.

**Ethnic populations:** Some groups may request a bilingual speaker or require a translator. Educators should be respectful of the culture and attitudes of the group they are addressing. Educators should be aware that some ethnic diets do not include foods that others consider common sources of calcium. High calcium foods that are ethnically appropriate should be substituted. In addition, many people of Asian, Hispanic/Latino and African descent may have difficulty digesting milk products.

**Individuals with special needs:** Some participants may have needs that require special consideration. Participants with specific needs not addressed in this guide should be advised to seek the advice of their health care professional.

**Provide the following information about this presentation on osteoporosis:**

- Welcome the audience and introduce yourself
- The amount of time of the presentation.
- This is an interactive presentation and the audience will be participating in some informative and entertaining activities.
- Participants are invited to ask questions about the information presented. At the presenter's discretion, questions may be responded to at any time during the presentation or at the end.
- Much of the information discussed today will be helpful to other people in their lives, such as their mothers, daughters or friends, and they are encouraged to share it with others.
- *Emphasize to participants that they should discuss any concerns about osteoporosis with their healthcare professional.*

# “INTRODUCTION”

## GOALS AND OBJECTIVES

- GOAL: is to increase awareness of osteoporosis, the risk factors, steps that can be taken to prevent the disease, treatment options, and what can be done to reduce the risk of fractures.
- OBJECTIVE: is to provide a broad-based community education program to educate the public about the prevention, diagnosis and treatment of osteoporosis.

Notes: \_\_\_\_\_

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## TESTIMONIALS

➤ **-Peggy, age 46**

“I was absolutely blown away to discover I had osteoporosis. And there are thousands of women out there in the condition I was in!”

➤ **-Dianne, Age 61**

“I was devastated! I was always very physically active in high school with hockey and track. I couldn’t believe it----I was in shock! My doctor told me not to pick up my grandchildren, a bag of groceries, or vacuum. I felt like I was in a bubble”.

➤ **-Linda, age 53**

“When the doctor revealed the DXA results, I was stunned. I’d been drinking lots of milk all my life, yet I had a full blown case of osteoporosis. If your doctor doesn’t suggest it, be assertive. You’ll be the one to pay the price if you’re not.”

## Supplemental Information:

### Anonymous:

- My uncle died in September. He was independent, living in his own home, and relatively healthy until he tripped last spring and broke his hip. He quickly spiraled downward into pneumonia and other complications. He never went home again. He went from the hospital to a nursing home. He was moved to a second nursing home because the "care" was so lacking at the first one. He was unable to feed himself, sit up, or even recognize his family. He is missed by his family and friends.

His death (from hip fracture complications) could have been prevented if his bones had been stronger and/or the fall had been prevented.

So get your calcium and vitamin D; exercise; and get rid of things likely to cause falls, especially in the homes of your older loved ones.

## **“FACTS AND FIGURES”**

### **NATIONAL STATISTICS**

- Osteoporosis affects more than 28 million Americans; 80% of them women and 20% men.
- 1 in 2 women and 1 in 8 men over the age of 50 will develop osteoporosis.
- Thin bones are the cause of more than 1.5 million fractures each year. The most common sites of fracture are the vertebrae (the bones in the spine), hip and wrist.

### **FLORIDA STATISTICS**

- Over 2.1 million individuals have osteoporosis or low bone mass.
- In 1998 - 22,630 residents had hip fractures.
- In 1998 - Hospital charges for hip fractures were \$477.8 million with 80% discharged to nursing homes (ACHA - Agency Health Care Administration).

## **VETEBRAL FRACTURES**

- Can lead to chronic back pain, loss of height, protruding stomach, stopped posture (back pain is the most common complaint).
- At age 50, a woman has a 50% chance of an osteoporosis related fracture during her life.
- Loss of ability to do daily living activities (cooking, cleaning, getting dressed, etc.).

### Supplemental Information:

- Loss of height & change in body image can lead to loss of self-esteem and depression.
- Difficulty breathing can cause discomfort with eating and digestion.

## **HIP FRACTURES**

- A woman's hip fracture risk is equal to her combined risk of breast, uterine and ovarian cancer.
- 15-20% need long-term care facilities.
- There is a 20% increased risk of death from complications in the first year following the hip fracture.

### Supplemental Information:

- At least half of those over 65 years old need help with daily living activities.

*Activity*

*Myths and Facts about Osteoporosis*

- One at a time, read the “Myths and Facts about Osteoporosis”
- Ask participants whether each statement is a ‘Myth or a Fact’.
- Review each statement with the group.

➤ ***Men do not get osteoporosis.***

***Myth.***

Men can and do get osteoporosis. Twenty percent of those with the disease are men. However, men are at less risk because they eat more (and therefore get more calcium), have greater peak bone density, and generally do not experience the equivalent of menopause.

➤ ***Diet can provide all of the calcium a body needs.*** ***Fact.***

Healthy individuals who eat a balanced diet can obtain adequate calcium. During this session, participants will learn more about calcium-rich foods.

➤ ***If your grandmother had osteoporosis, you will get it also.***  
***Myth.***

All women run the risk of osteoporosis. Heredity is only one of many risk factors. However, having one or more risk factors does not mean that a person will develop osteoporosis. We can do many things to promote bone strength.

➤ ***Dairy products are the only source of calcium.*** ***Myth.***

Although milk, yogurt and cheese are the richest sources of calcium, this presentation will provide information about other foods that also provide calcium, such as tofu, beans, and dark leafy greens. Calcium tablets are an additional source of calcium for individuals who cannot or will not fulfill their calcium requirements with their diets.

➤ ***If you have osteoporosis, you can do nothing about it. Myth.***

(Medication should be emphasized)

Individuals diagnosed with osteoporosis should adopt safety precautions to help avoid falls. Healthful eating habits and exercise can minimize bone loss for those diagnosed with osteoporosis. A physician may also prescribe medications. All therapies for osteoporosis should be supervised by a physician.

➤ ***Our bones stop growing when we reach full height (about age 20) Myth.***

Bones continue to increase in mass and density through young adulthood (between ages 20 and 30).

➤ ***Susceptibility to fractures can indicate osteoporosis. Fact.***

Osteoporosis is often called the “silent disease” because it is not apparent in its early stages. Normal x-rays do not show bone loss until 30% of the bone has been lost. Sometimes a fracture is the first indication of thinning bones.

- ***Low calcium intake during adolescence can cause osteoporosis later. Fact.***

Much bone growth takes place during adolescence, so the need for calcium is great. Bones that do not get enough calcium during this period are more susceptible to fractures that can occur in later years.

- ***Exercise is dangerous for older people. Myth.***

Exercise not only minimizes bone loss but may also prevent the risk of fracture. Exercise improves posture and increases muscle development and balance. Everyone should consult a physician or health care professional before beginning any exercise program.

## **MEN AND OSTEOPOROSIS**

- Lifetime risk of getting osteoporosis is the same as a man's lifetime risk for getting prostate cancer.
- Nationally, one in eight men over 50 will get osteoporosis.
- By age 75, one in three men will get osteoporosis.

# “ALL ABOUT BONES”

## OSTEOPOROSIS: “THE SILENT DISEASE”

- "Osteo" is Latin for "bone".
- "Porosis" means "porous" or "full of holes".
- “Osteoporosis” means "bones that are full of holes".
- Osteoporosis can develop without symptoms.
- Individuals may not know they have the disease until a bone fractures.

### Supplemental Information:

- Osteoporosis develops over a period of many years, as a result of the acceleration of the natural process of bones becoming thinner.

## TYPES OF BONE

- Bone consists of two types of tissue—cortical and trabecular.
1. Cortical is the hard, compact dense bones (examples are the mid-section of larger, long-bones of the arms and legs).
  2. Trabecular is spongy, porous and flexible bone (examples are the wrist, hip and spine).

## Supplemental Information:

- spongy bone contains a great deal of open spaces.
- the spongy bone of the wrist, the spine and the femur (thighbone) are most susceptible to fracture.
- Deterioration of living bone tissue makes bones fragile and more likely to fracture.

### **Activity**

### **Understanding Our Bones**

#### **Materials: Styrofoam, shredded wheat, or a sponge**

- Use Styrofoam, shredded wheat, or a sponge to assist the audience in understanding the structure of bones.
- Explain to the audience that when osteoporosis occurs, bones become thinner and more perforated, and thus are more susceptible to fracture.
- Shredded wheat can be used to illustrate how easily thin, porous bones can break. Styrofoam or a sponge can be used to illustrate the porosity of bone.

## **HEALTHY BONE**

- Bone is living tissue, which is constantly being broken down and rebuilt, a process called remodeling.
- Bone is renewed like other tissues in the body, such as skin, hair and nails.

## **OSTEOPOROTIC BONE**

- (Point to the arrow pointing to the micro fracture of the osteoporotic bone).
- The loss of living bone tissue makes bones fragile and more likely to fracture.

## **BONE REMODELING**

- Bone is renewed through a process called bone remodeling which consists of two processes: resorption and formation.
- Resorption removes old bone. During the resorption process, calcium is released from the bone to be used by other cells in the body for their normal functions. Certain things you do can affect how much calcium is released from the bone.
- Formation replaces old bone with new bone.

## **OSTEOCLASTS-PHASE 1**

- Cells called osteoclasts (think “C” for chiseler) seek out old bone or damaged bone tissue and destroy it, leaving small spaces (resorption).

## **OSTEOBLASTS-PHASE 2**

- Cells called osteoblasts (think “B” for builder) use minerals like calcium, phosphorus, and vitamin D to fill in the spaces with new bone (formation).

## **BUILD YOUR BONE BANK**

- You build bone until about age 30.
- Steps to building strong bones:
  1. Calcium & vitamin D
  2. Weight bearing exercise
  3. Limit Caffeine & Alcohol
  4. Don't Smoke

## **BONE BANK DEPOSITS**

- From birth through adolescence, new bone is built faster than old bone is removed, so bones grow larger, heavier and denser. During this period, the tiny skeleton of a baby grows to its adult height.
- During mid-life, depending on lifestyle and other factors, bone removal can achieve a balance with bone formation.
- After menopause in women, bone removal accelerates due to a sharp decline in estrogen.

### Supplemental Information:

- During adolescence, when bones are growing rapidly, boys begin to develop greater bone mass than girls and, African Americans begin to in general, develop greater bone mass than Caucasians and Asians.

## **BONE LOSS AND AGING**

- The first 5-15 years after menopause a woman can lose approximately 25-30 % of trabecular bone and approximately 10-15% of cortical bone.
- Bone loss often occurs without symptoms or warning signs.

## **CHANGES IN BONE MASS WITH AGE**

- After menopause in women, bone removal accelerates due to a sharp decline in estrogen, a hormone that has a protective effect on bones.

## **EARLY WARNING SIGNS**

- History of broken bones as an adult.
- Unexplained back pain-subsidies after a couple of weeks.
- Loss of more than an inch in height.
- Stooped posture.

## **OSTEOPOROSIS**

- The “dowager’s hump” is a sign of advanced osteoporosis.
- As the lungs and intestines get compressed, breathing and digesting food becomes difficult.

## CLARIFICATIONS

- There is no relationship between osteoporosis and arthritis.
- Osteoporosis is a generalized bone disease that causes porous bones, usually not causing symptoms until a fracture occurs.

## CLARIFICATIONS

- Arthritis refers to a group of diseases and conditions that affect the joints and which are usually painful.
- Despite its name, osteoarthritis, which is a degenerative type of arthritis affecting the hip, knees, the tips of the fingers and other joints, has no relationship to osteoporosis.

## CLARIFICATIONS

- Steroids are sometimes used to treat arthritis, and using steroids may put a person at risk for osteoporosis.
- There is no clear relationship between dental cavities and osteoporosis.
- However, someone with osteoporosis may have weakened jawbones that cannot hold teeth as well and may be prone to losing teeth.

## “RISK FACTORS”

### RISK FACTORS YOU CAN'T CONTROL

#### *Activity*

#### *“Risk Factors Work Sheet”*

- Ask participants to check all of the characteristics listed on the “Risk Factors Work Sheet” that pertain to them. Ask participants to circle all of the factors that they believe they can change.
- Explain that all of the characteristics listed on the worksheet are risk factors for osteoporosis, and that people often are unaware of many of these risk factors.
- Point out that while many of these risk factors are a result of things over which we have no control, such as heredity, environment, or other diseases, many other risk factors are attributable to lifestyle, and thus can be controlled.

- **Gender:** Females are diagnosed with osteoporosis at four times the rate of males. Bone mass in males is approximately 15-20% higher than in females. The greater the bone mass and density, the less the chance of developing osteoporosis.
- **Small Boned and Thin:** may result in smaller bones with a lower bone density.
- **Race/Ethnicity:** Women (particularly Asian and Caucasian with thin frames) and those with small bones run a greater risk when natural bone loss occurs. African American women have a higher peak bone mass (10% more) than Caucasian women, but other factors such as nutrition, exercise, and certain diseases and medications may increase the likelihood of osteoporosis in this group.
- **Heredity:** Being at risk for osteoporosis may be genetically inherited or may be a result of family members sharing the same environment, exercise, and nutrition habits. It also may be a combination of both factors.
- **Menopause or several months without periods:** In postmenopausal women, bone loss begins to exceed bone formation due, in part, to a decrease of estrogen. Women who have lost the ability to produce estrogen before natural menopause may not have absorbed enough calcium during crucial periods of growth. Also, in the first few years of both natural and surgically-induced menopause, women lose bone at a faster rate.

- **Age:** In your 40's we start to lose bone faster than we build new bones. The accumulated loss of bone puts an older person at higher risk.

#### Supplemental Information:

- There are many reasons why a person may be at risk for developing osteoporosis and it is helpful for each person to understand her or his individual level of risk.
- All women are at risk for developing osteoporosis and must be concerned about the condition.
- Not all women will develop osteoporosis.
- Though some risk factors are beyond our control, there are many things we can do to prevent osteoporosis.
- Risk factors can identify only about 50% of individuals with osteoporosis. The other 50% are diagnosed by bone density testing.
- It is important for individuals to speak with health care professionals in order to determine their level of risk for osteoporosis.

## RISK FACTORS YOU CAN CONTROL

- **Diet--Calcium rich:** Milk, cheese and yogurt are the easiest and richest sources of calcium. (Lowfat and nonfat products are recommended).
- **Exercise:** Weight bearing exercises like walking, running, and biking. Exercise is of primary importance in maintaining healthy bones. However, too much exercise can cause a woman to temporarily cease menstruation (stop getting her periods), thus limiting her production of estrogen.
- **Vitamin D:** Vitamin D assists the body in absorbing calcium. One source of Vitamin D is the sunshine. Vitamin D also can be obtained from sources such as vitamin D-fortified milk, vitamin D-enriched foods, or most multivitamins.
- **Caffeine:** Cola, coffee and chocolate all contain caffeine, which increases the amount of calcium excreted in the urine. No more than 2-3 cups of caffeine beverages per day is recommended.
- **Alcohol:** Alcohol directly suppresses bone formation. Consuming more than one alcoholic drink per day is associated with risk of low bone mass.

- **Eating Disorders:** anorexia nervosa or bulimia can lead to malnutrition and bone loss. Young women with eating disorders such as anorexia or bulimia miss the opportunity to build dense bones during important years of bone development and may develop osteoporosis at an early age.
  
- **Smoking:** Women who smoke have lower estrogen levels and earlier menopause. Stopping smoking at any age slows bone loss.
  
- **Immobility:** extreme lack of exercise can lead to bone loss.

Additional Information:

- Prolonged immobilization such as bed rest reduces the stress placed on the skeleton and can result in excess bone loss.
  
- Maintaining body weight for those who are not overweight is important to maintaining bone mass. Weight loss reduces the stress placed on the skeleton and can lead to bone loss. When weight loss is due to eating disorders, amenorrhea and bone loss may be the result.

## OTHER RISK FACTORS

Certain diseases and medications may also increase the risk for osteoporosis:

- **Steroids:** Cortisone and other glucocorticoids, cause increased bone breakdown and decreased bone replacement, leading to overall bone loss. In addition, steroids can lower calcium absorption and increase excretion of calcium in the urine. Certain diuretics may also increase excretion of calcium in the urine.
- **Prolonged hyperthyroidism:** or long-term treatment with excessive amounts of thyroid hormone, hyperparathyroidism, rheumatoid arthritis, renal insufficiency, chronic hepatitis and chronic diarrhea or intestinal malabsorption syndrome can cause increased the risk of bone loss.
- **Thyroid hormone:** (in excess) acts on bone cells to increase resorption.
- **Diuretics:** some types of diuretics may increase excretion of calcium in the urine.
- **Kidney failure:** affects the metabolism of calcium, phosphorous and vitamin D.
- **Chronic hepatitis:** chronic liver disease may cause bone loss in several different ways.

- **Intestinal disease:** some can affect the absorption of vitamin D and calcium.

## **DRUGS—BONE LOSS**

- **Certain drugs:** may cause bone loss Cortisone, seizure drugs, Cyclosporine, Methotrexate, some hormones (Zoladex-Lupron), Isoniazid, Lithium, Heparin. Consult your healthcare provider.

## “PREVENTION”

### CALCIUM’S FUNCTION

- Adequate levels of calcium in the bloodstream are needed to help control bleeding, to regulate heartbeat, for healthy muscle function, to enhance nerve transmission and bone formation.

Supplemental Information:

- Nutrition is an important factor related to preventing osteoporosis, and it is important to ensure that our diets include bone-strengthening foods.
- The body requires calcium from outside sources for the formation of bone, as the body does not produce calcium. It is important to include enough calcium-rich foods in the diet to build and maintain strong bones.
- 99% of the body’s calcium is found in teeth and bones.

### DAILY CALCIUM REQUIREMENTS

- Point out that some groups need more calcium than other groups.
- Chart from National Academy of Science.

## CALCIUM NEEDS

- **Adolescents:** frequently eat high-fat snacks with “empty” calories, which may spoil their appetites for healthy foods, and sometimes drink soda, which may replace milk as a beverage.
- **Eating Disorders:** anorexic or bulimic teens lack calcium and may develop osteoporosis at an early age. Also, teen girls often do not get enough calcium because they diet.
- **Older adults:** The calcium requirements in this group increase because individuals, for a variety of reasons, do not absorb calcium as readily as they get older.

### Supplemental Information:

- **Pregnant and nursing women:** Although the updated guidelines do not call for increased amounts of calcium for women who are pregnant or nursing, these women should be certain to achieve the guidelines set forth for their age group. During pregnancy, calcium is needed by both the mother and the baby. Calcium needed by the baby will be taken from the mother’s bones if not enough calcium is supplied, increasing the mother’s risk for osteoporosis later in life. Pregnant teens require even more calcium because their own calcium needs are greater.
- Growth periods for bone length and mass are the greatest during adolescence and early adulthood. “Milk is just for kids” is a popular myth today.

## **SERVING SIZE**

- 1-½ cups of (12 oz) liquid is the size of a soda-pop can.
- 1-cup (8 oz) food is the size of a large handful.
- ½ cup (4 oz) food is about half a large handful.
- 3 (oz) cooked meat, fish, poultry is about the size of a deck of cards.
- Serving size is the size of the food after the food is cooked.

Supplemental Information:

Sample serving sizes of food

- 1 cup (8 oz) of low-fat or fat-free milk
- 2 cups (16 oz) of low-fat or fat-free cottage cheese
- 1 cup of low-fat or fat-free yogurt
- 3 cups of broccoli
- 1 cup of collards or turnips

## DAILY SERVINGS

### ➤ Play Calcium Card Game

#### *Activity*

#### *“Calcium Cards”*

- It is important to become familiar with the foods that are rich in calcium in order to be able to make healthy choices.
  - Invite ten volunteers to the front of the room. Distribute the ten “Calcium cards” to the volunteers and ask them to face the audience, holding their cards so the rest of the group can see the pictures.
  - Instruct the volunteers to line up so that the calcium content of the foods on their cards is in ascending order, from (1) being the least amount of calcium to (10) being the greatest amount of calcium. When they have formed a line, invite the audience to help correct the order if necessary.
- Cream cheese is mostly fat and contains less calcium than most people think. Draining non-fat yogurt for several hours through cheesecloth makes a calcium-rich spread similar to cream cheese.

- Eggs: Even though eggs are found in the dairy case, they do not contain valuable amounts of calcium.
- Low fat cottage cheese contains only 80 mg. of calcium because cottage cheese is separated into curds and whey, and the whey, which contains some milk, is removed.
- Cheddar cheese and other “hard” cheeses are higher in calcium content than softer cheeses.
- Milk is a valuable source of calcium and also is fortified with significant amounts of Vitamin D.
- Vegetarian lasagna (made from low- or no-fat cheeses) is a “combination food” and contains calcium from several sources.

## CALCIUM IN FOOD

*Activity*

*Calcium Cards, continued*

The correct order of the calcium cards and the amounts of calcium contained in each food are as follows:

- |   |                        |
|---|------------------------|
| <b>1. 1 oz. cream cheese:</b>                   | <b>20 mg. calcium</b>  |
| <b>2. 1 hard boiled egg:</b>                    | <b>30 mg. calcium</b>  |
| <b>3. 1/2 cup cooked broccoli:</b>              | <b>40 mg. calcium</b>  |
| <b>4. 1/2 cup cottage cheese:</b>               | <b>80 mg. calcium</b>  |
| <b>5. 1 ounce cheddar cheese:</b>               | <b>205 mg. calcium</b> |
| <b>6. 6 oz. calcium-fortified orange juice:</b> | <b>250 mg. calcium</b> |

7. 1 cup milk:	300 mg. calcium
8. 1 cup fruit yogurt:	345 mg. calcium
9. 3 oz. sardines with bones:	370 mg. calcium
10. 8 oz. vegetable lasagna:	450 mg. calcium

*Alternate Activity*

*“Calcium Worksheet” handout*

- Instead of inviting ten volunteers to the front of the room to rank the calcium cards, ask the audience to complete the “Calcium Worksheet” by rating the calcium content of the listed foods, on a scale of one to ten with “1” representing the least amount of calcium and “10” representing the highest amount of calcium.

**FOOD LABELS**

- Serving size and number of serving.
- Calories, total & saturated fat.
- Cholesterol & sodium, fiber, sugars, & protein in grams.
- % daily value (DV).
- Daily amount.

## READING FOOD LABELS

### *Activity*

### *Nutritional Facts*

- Calcium content varies greatly between brands (example: 8 oz of yogurt may have 25% calcium while others have 40% calcium).
- The percentage of calcium in a food is based on 1,000 milligrams. A food containing 20% of the daily value of calcium would contain 200 milligrams.
- A food containing 10-19% calcium is a good source, and that 20% or higher indicates a very good source.

## % DAILY VALUE OF CALCIUM

- Add up the % of DV by reading food labels to ensure you get your recommended daily calcium.

*(Versions for, African-American, Chinese-American, Haitian-American, Hispanic/Latino, and/or Southeast Asian-American diets should be included as appropriate for audience.)*

- Circle all of the foods listed on "Foods and Calcium" that they have eaten today if this is an (evening presentation) or the food they ate yesterday.
- Add up the milligrams of calcium they consumed.
- Compare the milligrams of calcium they consumed to the recommended amount of calcium for their age group.
- Point out that it may be helpful to track their calcium intake for a while.

Supplemental Information:

- **Milk, yogurt and cheese.** These are the richest sources of calcium, although they are not the only sources. Low-fat or skim milk, and low- or no-fat cheese and yogurt products are recommended. Encourage participants to sample several different brands in order to find those that taste the best. Lactose-reduced products are also available.
- **Calcium-fortified juices.**
- **Bok choy, broccoli, kale and turnip greens.** Three to four cups of cooked broccoli have the same calcium content as one cup of milk.

- **Tofu and other soy products.** These are calcium-rich if they are processed with calcium sulfate or calcium chloride. Firm tofu has a higher calcium content than soft tofu because more water has been pressed from it.
- **Canned sardines and salmon with bones.** Bones are soft enough to be mashed or chewed.

## LACTOSE INTOLERANCE

- Lactose intolerance occurs when a person has difficulty digesting the sugar found in milk, which is called lactose. An enzyme called lactase, which is made in the body, breaks down lactose. Once the sugar is broken down, it can be absorbed. In some people, the body gradually makes less lactase as they grow older.
- Start with small portions of food such as milk and gradually increase portion size over time. Many lactose intolerant individuals can tolerate small amounts of milk products, such as 1/4 or 1/2 cup of milk at a time (low fat or skim milk, cheese and yogurt products are recommended).
- Eat foods in combination with other foods. It may be helpful to eat dairy products with a meal or snack, which slows down digestion and may help eliminate symptoms.
- Some individuals may be able to eat hard cheeses such as cheddar and Swiss, yogurt with active cultures, and milk treated with enzymes.

- Commercial enzyme products that can be taken orally or added to foods are also readily available.

#### Supplemental Information:

- People with lactose intolerance have a lack of the enzyme lactase. Therefore, some of the lactose passes through the digestive system without being digested and absorbed. This can lead to symptoms such as gas, bloating, cramps, and/or diarrhea.
- Reduced-lactose milk and some cheeses are widely available in local supermarkets. They are pre-treated with the enzyme lactase to reduce the milk sugar content up to 70%. Some also have calcium added.
- Eat yogurt. Some kinds of yogurt contain active cultures that digest some of the lactose and continue to digest it once inside the digestive tract.
- Choose aged cheeses such as Swiss, cheddar, and Parmesan. The aging process removes most of the lactose in cheese, making them naturally low in lactose.
- Convert regular milk into reduced lactose milk by adding drops of a lactase enzyme preparation. Lactase enzymes may be purchased at most pharmacies.
- Lactase preparations are also available in chewable tablets, which may be consumed before eating foods containing lactose.
- Lactose intolerant individuals should not use calcium lactate supplements, which may cause side effects.

## CALCIUM SUPPLEMENTS

- Read labels-many different types of calcium.
- Bone meal and dolomite are not recommended because they may contain toxic metals such as mercury or lead.
- “Elemental calcium” is the term for the actual calcium that is contained in a supplement. This is the type of calcium that the body absorbs. The amount of elemental calcium contained in a supplement will vary depending on the type of compound the supplement contains.

### Supplemental information:

- A well-balanced diet can provide adequate calcium, but for those who do not get enough calcium in their diet, a calcium supplement may help to them to meet their daily requirement.
- A high calcium intake through supplements will not prevent osteoporosis that is caused by lack of physical activity, high alcohol consumption, smoking, and various medical disorders or treatments.
- Calcium supplements should always be taken on the advice of a physician or health care provider. If participants are taking a supplement, they should tell their health care providers.
- If additional calcium in supplement form is recommended, several varieties are available. Calcium supplements come in many forms, types, and flavors: pills, chewable tablets, syrups, effervescent tablets, and in fruit drinks.

- Chewable tablets should be chewed completely before swallowing.
- In order for the calcium contained in the supplement to be absorbed, the supplement should be taken at the correct time. This may be before, during, or after a meal, or with a cup of water or juice. Some should be taken once a day, others several times during the day. When purchasing a supplement, consult with a pharmacist regarding how and when it should be taken.
- Individuals who are prone to kidney stones may need to limit their calcium intake. It is particularly important that these individuals discuss their calcium needs with a healthcare professional.
- Calcium supplements should not be taken with iron.
- Emphasize to the audience that there is no general rule regarding when and how a supplement should be taken because this varies with each type of supplement. The best source of information regarding how and when supplements should be taken is a pharmacist.

## **ELEMENTAL CALCIUM**

- There are many calcium compounds, and each compound contains a different amount of elemental calcium:

<u>➤ Kinds of Calcium</u>	<u>Elemental Calcium</u>
• Calcium carbonate	40%
• Calcium phosphate (tribasic)	39%
• Calcium phosphate (dibasic)	30%
• Calcium citrate	21%
• Calcium lactate	13%
• Calcium gluconate	9%

- The amount of calcium in a supplement does not indicate the amount of elemental calcium that it contains. For example, a 500-mg. calcium supplement tablet may only contain 45-200 mg. of elemental calcium.

Supplemental Information:

- The amount of elemental calcium in a tablet is based on 1000 mg dosage, and will be expressed in a percentage. For example, if the label says each tablet contains 40% of the recommended daily dose, there will be 400 mg of elemental calcium in each tablet.

**CALCIUM TIPS**

- Individuals should not take more than 500 mg. of calcium at one time (as the body cannot absorb more than that amount) or a total of 2000 mg total per day.
- The body generally will absorb only 500 to 600 mg at a time. Example: take one calcium tablet at breakfast and another calcium tablet at dinner.

## CALCIUM CARBONATE & CITRATE

- Calcium carbonate is the principle chemical contained in calcium supplements and is also contained in some chewable tablet antacids. Calcium carbonate needs acid to dissolve and for absorption, may be difficult to digest, and is best taken with or immediately following meals.
- Calcium citrate, does not require stomach acid for absorption so it may be taken between meals and on an empty stomach. Also it is recommended for individuals who have difficulty digesting calcium carbonate. It is also recommended for older individuals. It may cost more than carbonate.

### Supplemental Information:

- Calcium citrate, aspartate, and lactate tend to be the most readily absorbed into the bloodstream.
- Side effects of calcium supplementation include the following:
  - Flatulence (gas from the bowels) and constipation: most frequently associated with calcium carbonate and least likely with calcium citrate.
  - Toxicity is rare but possible, especially in the following instances:
    - individuals taking thiazide drugs, or substantial amounts of antacids or Vitamin D,
    - individuals with disorders of calcium metabolism, such as hyperparathyroidism, hyperthyroidism, sarcoidosis, and renal failure.

- Emphasize to the audience that everyone should discuss calcium supplementation with a healthcare professional.

## **TEST YOUR CALCIUM TABLET**

- Put a calcium tablet in a cup of half water and half vinegar. Stir every 5 minutes. If it doesn't dissolve in 30 minutes, it probably won't dissolve in your stomach.

### Supplemental Information:

- Some medications and health conditions inhibit calcium absorption. Participants should discuss any existing medical conditions with their physicians.
- Some medications may interfere with calcium metabolism. Never stop taking medication that has been prescribed unless directed to do so by a healthcare provider.
- High salt intake increases calcium excretion in the kidney.
- Diuretics do not affect calcium absorption but some diuretics increase the amount of calcium excreted in the urine.
- Magnesium is an essential mineral for good bone health but a nutritious diet provides all the magnesium a person needs and there is no need for a supplement for most healthy individuals. Individuals with existing bone disease should discuss the need for magnesium supplement with a health care professional.

- Some medical conditions that may inhibit calcium absorption are:
  - Anorexia and bulimia
  - Cushing's Syndrome
  - Gastrectomy
  - Hemolytic anemia
  - Hyperparathyroidism
  - Hyperthyroidism
  - Kidney insufficiency
  - Chronic hepatitis
  - Lymphoma, leukemia
  - Malabsorption
  - Mastocytosis
  - Multiple myeloma
  - Prolonged parenteral nutrition
  - Rheumatoid Arthritis
  - Type 1 Diabetes

### **VITAMIN D IS THE KEY**

- Vitamin D plays an important role in helping our bodies absorb calcium.
- Taking a multivitamin that contains 400 IUs of vitamin D is considered adequate. Some calcium supplements also contain vitamin D. Emphasize that individuals should not take more than 800 units of vitamin D including all forms of supplements unless under a physician's supervision.

- One cup of milk contains approximately 100 units of vitamin D and 300 mg. of calcium.

#### Supplemental Information:

- One source of vitamin D is sunshine. People can obtain their daily requirement of vitamin D by spending a minimum of 5 and a maximum of 15 minutes (depending on time of day, season, and latitude) outdoors in the sunshine three times a week with arms and face exposed. The amount of time depends on one's sensitivity to sunburn. Sunscreens used to protect the skin from burning will block the spectrum of rays responsible for making vitamin D in the skin.
- The body cannot produce vitamin D in the skin during the winter months in the northeastern part of the United States because the angle of the sun prohibits adequate exposure to the sun. However, it is possible to make vitamin D all year long in warm, sunny locations like Florida. During the winter months in the northeast, people can get the daily recommended 400 units of vitamin D from vitamin D-fortified milk, cod liver oil, and most multivitamin supplements. Cereals and some breads are also fortified with vitamin D.
- Some calcium supplements contain Vitamin D, and may be helpful in ensuring that they are receiving adequate amounts of Vitamin D. However, individuals should not take both a vitamin D supplement and a calcium supplement containing vitamin D to avoid toxicity, unless recommended by a health care provider.
- Elders may wish to discuss vitamin D with their physician or healthcare provider.

## EXERCISE!

- Point out to the audience that another way to increase bone retention of calcium and promote bone health is through exercise.

***Affirm to the audience that they should always consult with a health care provider before beginning any exercise program***

*It may be helpful to note that these classifications of exercise pertain to the effects on the skeleton or skeletal muscles rather than to aerobic exercise, which requires additional effort by the heart and lungs. While many of the exercises which fit into these categories may be classified as aerobic, not all aerobic exercises provide benefits to the bones. Note: swimming is a good source of exercise but is not weight bearing, and thus, not particularly helpful for building bone.*

<i>Activity</i>	<i>Exercise Guide</i>
<p>Observe to the audience that they have been sitting for a long time and that they will now have the opportunity to stretch and to learn some easy movements that can help improve balance and strengthen their bones.</p>	<p>Point out that poor balance is frequently the cause of falls, and that it is helpful to practice improving one's balance.</p>
<p>Ask the audience to stand up slowly. Point out that many falls occur because people stand up and begin walking too quickly.</p>	

Model and guide the audience through the following exercises:

#### CORRECT POSTURE:

- Stomach tight.
- Lower back straight, shoulder blades pinched together.
- Knees slightly bent.

#### HIP EXTENSION:

- Stand holding onto the back of a chair and bend forward about 45 degrees at the waist.
- Lock the knee and lift one leg straight out behind you as high as possible without bending the knee or moving the upper body. The movement should be smooth and controlled.
- Slowly lower leg to the starting position.
- Complete 8 repetitions on both sides, alternating legs between lifts.
- Rest.
- Repeat set.

#### MODIFIED SQUAT:

- Hold onto chair.
- With knees soft and slightly bent, do a pelvic tilt (hold stomach in while flattening your back)
- Slowly lower yourself 6-8 inches.
- Hold this position for 5 seconds while maintaining the pelvic tilt.
- Relax.
- Return to standing position.
- Repeat.

## *Activity*

## *Discussion*

Invite members of the audience to share their insights about exercise with each other. The following questions may be helpful in encouraging discussion:

- Which exercises do they prefer?
- How do they make exercise more interesting?
- Does anyone walk in a group? Are there any mall walkers present?
- How do they exercise in inclement weather?
- What activities are offered at the local senior center, “Y” or religious center?

Supplemental Information:

- Explain to the audience that exercise is a key factor in preventing osteoporosis and in slowing bone loss. Exercise strengthens bones and muscles, helps maintain balance, and enhances our reflexes. Exercise also increases energy, reduces stress, promotes cardiovascular health, and contributes to an overall sense of well being.
- Muscles pulling on bone builds bone. For example, tennis players have stronger muscles and denser bones in their playing arms. Cyclists may have stronger leg muscles and denser leg bones.

- Daily activities such as hand washing clothes, kneading bread, raking, sweeping, and rolling down a car window are strengthening activities.
- Other healthy exercises include:
  - walking (one of the best)
  - hiking
  - climbing stairs
  - dancing
  - treadmill
- It is possible to add more movement to one's daily activities by making simple changes like:
  - parking the car at the far end of the parking lot
  - taking the stairs instead of the elevator
  - standing instead of sitting
  - standing and stretching or lifting light weights while watching television
  - doing pelvic tilts while waiting in line
- It is very important that everyone should consult a doctor before beginning any type of exercise.
  - Individuals with high blood pressure should take extra precautions against dizziness, which can result in injury when exercising.
  - Those with back problems may require an exercise program prescribed by a physician and instructed by a physical therapist or exercise physiologist.
- Individuals who have been relatively inactive should begin slowly with any kind of exercise program, and gradually build up their amount of exercise. Any kind of exercise, no matter how simple, is beneficial. The intensity and duration of the exercise should increase gradually.

- Elders should begin with 5 to 10 minutes twice a week and build up slowly, adding a few minutes each week until they build up to 30 minute periods, three times a week.
- Lifting small objects or light weights helps elders build muscle, which strengthens bones.
- Exercises that improve balance are very important for elders.
- Do not over-exercise. Women who over-exercise to the point of stopping menstruation weaken their bones.
- Stand or sit up straight. Poor posture interferes with breathing, raises blood pressure, contributes to dowagers hump, and increases the risk of falling. Correcting posture helps improve balance and strengthen muscles.

## ENVIRONMENTAL SAFETY

In addition to healthy nutrition and exercise, another way to prevent painful fractures is by taking safety precautions at home and in the community.

### *Activity*

### *“Environmental Safety Cartoon”*

Assist the audience in identifying the following hazards:

- Slippery floors
- Spills
- Scatter rugs
- Loose electrical wires
- Alcohol

- Medications that might cause dizziness
- Objects on stairs
- Inadequate light fixtures
- Lack of stair railings
- Snow
- Walker is in a corner and out of reach
- Pet and pet food dish
- Wearing glasses on her head
- Talking on the phone
- Wearing high heels
- Wearing long robe

## “BONE DENSITY TESTING”

### WHO NEEDS TESTING?

Osteoporosis is often referred to as the “silent disease” because many people do not know they have osteoporosis until they fracture a bone. Testing is recommended if:

- you have major risk factors
- you have a family history of osteoporosis
- you have a personal history of fractures after age 45
- you are a smoker
- you are small boned and thin
- you are postmenopausal, and not on estrogen replacement therapy
- *Consult your healthcare provider*

Supplemental Information:

- Ordinary X-rays cannot clearly detect osteoporosis until at least 30% of the bone density is lost, and are not helpful in detecting early bone loss.
- Bone density testing measures the amount of mineral in bone which is mainly calcium, with minimal exposure to radiation.

## **SCREENING TESTS**

Some of the Portable Scanners are:

- SXA - (Single Energy X-ray Absorptiometry)—used on wrist or heel
  
- pDXA – (Peripheral Dual Energy X-ray)—used on wrist or heel
  
  
  
  
  
  
  
  
  
  
- RA – (Radiographic Absorptiometry) -x-ray of hand that is compared to a small metal wedge
  
  
- QCT – (Quantitative Computed Tomography) - measures the spine
  
  
- Ultrasound-sound waves use to measure the heel, shin, and kneecap

## **PICTURE OF BONE DENSITY TESTING**

- Machine is open--many women believe that being tested involves being enclosed within a machine, or that the test is painful or harmful.
  
- Having a bone density test is similar to having an x-ray.

## WHAT IS A DXA?

- DXA (dual energy x-ray absorptiometry) is the “gold standard” test to determine a diagnosis.
- Measures bone density in the hip, spine and forearm.
- Painless, non-invasive, requires no injections.
- Takes 10-20 minutes.

### Supplemental Information:

- Bone density tests conducted over a period of time are often suggested for some individuals for comparative purposes. In order for results to be valuable, all of the tests should be conducted with the same instrument.
- The appropriateness of having a bone density test varies according to the needs of each individual. The need to be tested and the various testing options that are available should be discussed with a physician.
- Various types of scans have been developed, but the most commonly used today is the “DXA” scan, which can measure bone density at the hip, spine, and forearm. Peripheral scans, which measure bone density at the wrist or heel, can be used to indicate risk for osteoporosis, but a DXA scan is the only scan used for absolute diagnosis.

## WHAT IS A T-SCORE?

- Osteoporosis is diagnosed by measuring the density of the bones in the hip and spine and comparing it to the average bone density of healthy young Caucasian women.
- The World Health Organization uses a "T-score" to define osteoporosis.
  - T-score 0 to -1.0 = normal bone mass
  - T-score between -1.0 and - 2.5 = osteopenia or low bone
  - T-score of -2.5 or lower = osteoporosis

### Supplemental information:

- Though decreases in bone density are often associated with fractures, not all individuals with reduced bone density will develop fractures.
- Bone density measurements are compared with the average bone density measurements in young adults and with the average measurements in control subjects of the same age and gender.
- Osteoporosis is diagnosed when the bone density measurement is 2.5 standard deviations below peak bone mass.

# “INSURANCE”

## INSURANCE

- Bone density testing is not performed routinely. Most insurance policies cover bone density testing for diagnostic purposes only, not as a screening test.

## MEDICAID

- Florida’s Medicaid program will cover “medically necessary” osteoporosis coverage for “high risk” individuals.

## MEDICARE

- women over 65.
- men and women with previous spinal fractures.
- men and women on prednisone or other steroid-type medications or who are planning to begin such medications.
- men and women with primary hyperparathyroidism.
- men and women being treated for osteoporosis to see if the therapy is working.

- These benefits apply to all Medicare plans, although ordinary deductibles and co-pays may apply.
- Medicare will cover a test every two years, but only if ordered by your healthcare professional.

## “MEDICATIONS”

### MEDICATIONS

- Estrogen “ERT”
- Fosamax® also known as Alendronate.
- Actonel® also known as Risedronate.
- Evista® also known as Raloxifene.
- Miacalcin® also known as Calcitonin.

### ESTROGEN

- Estrogen is generally recommended as the most cost-effective prevention for osteoporosis for postmenopausal women and women whose ovaries were removed or rendered nonfunctional before age 45.
- Estrogen has been proven to slow bone loss, may slightly increase bone mass, and decrease susceptibility to fracture in postmenopausal women.
- Estimated to reduce fractures by 30-50%.

## Supplemental Information:

- Estrogen involves some risks and drawbacks. Estrogen is not recommended for women with certain medical conditions.
- Estrogen deficiency accounts for 20%-30% of total bone loss over a woman's lifetime.
- In women who are at high risk, exercise and a calcium-rich diet alone are not acceptable means of preventing osteoporosis. High-risk women should discuss other prevention options with their health care providers.
- Although, estrogen therapy may result in modest increments (2%-4%) of bone mass in women, it reduces fractures by 30%-50%.
- Estrogen therapy may also have cardiovascular benefits. However, estrogen therapy is not without risks and is not appropriate for some women. The long-term effects of hormone therapy are presently under study.
- In women who still have their uterus, estrogen should be combined with medroxyprogesterone to prevent the uterus lining from building up to a precancerous level. If progesterone is added to estrogen for 12 to 14 days each month, monthly withdrawal bleeding occurs in the majority of women. If the regimen is a continuous low dose, many women initially experience spotting. However, the majority of women cease to experience bleeding after one year. One advantage proposed for this combination was to prevent the uterus lining from building up to a precancerous level.

- Estrogen is available as an oral medication or as a patch.
- Estrogen therapy may slightly increase the risk of breast cancer. Consequently, monthly breast self-examination and annual mammograms are important.
- The risks of hormone therapy should be weighed carefully with a health care provider in light of each patient's specific medical history and risk profile.

### **EVISTA® (Raloxifene)**

- (*SERMS*)-*Selective Estrogen Receptor Modulators*- SERMS are synthetic drugs and sometimes called “designer drugs”.
- SERMS have a few of the same effects as estrogen, but don't stimulate breast or uterine tissue like estrogen does.
- Evista (Raloxifene) is the first and only SERM approved for the prevention and treating of osteoporosis.

Supplemental Information:

- Dosage is 60 mg daily dosage.

### **BISPHOSPHONATES**

- Currently, two bisphosphonates - (1) Alendronate (Fosamax®) and (2) Risedronate (Actonel®).

- Specifically designed to affect the skeleton, by increasing bone density and reducing the number of fractures.
- Must be taken correctly—on an empty stomach, first thing in the morning with a glass of plain water, remain upright (standing or sitting) and fasting for 30 minutes.

### **FOSAMAX® (Alendronate)**

- Fosamax is approved for prevention of osteoporosis in women with low bone mass or postmenopausal women who cannot or will not take estrogen and treatment for men and women with diagnosed osteoporosis.
- Also approved for treatment of glucocorticoid-induced osteoporosis in men and women.
- Dosage is 5 mg daily for prevention, and 10 mg daily or 70 mg weekly tablet for treatment (for men and postmenopausal women and for people on steroids).

### **ACTONEL® - (Risedronate)**

- Approved in a 5 mg dose for preventing and treating osteoporosis in postmenopausal women.
- Approved in 5 mg dose for treatment of glucocorticoid-induced osteoporosis in men and women.

### **MIACALCIN® - (Calcitonin)**

- Calcitonin is a naturally occurring hormone involved in calcium regulation and bone metabolism.
- Available in injection and nasal spray.

#### Supplemental Information:

- In women, at least five years past menopause, calcitonin slows bone loss, increases spinal bone density and may relieve the pain associated with bone fractures.

## “PUTTING IT ALL TOGETHER”

### SUMMARY

- Eat a balanced, calcium-rich diet.
- Obtain Vitamin D from sunlight, diet, or a multivitamin.
- Engage in exercise and weight-bearing or weight-training activities on a regular basis.
- Develop good safety habits that help prevent fractures.
- Eliminate the use of cigarettes.
- Minimize the use of caffeine and alcohol.
- Bone density testing and medications when appropriate.

### HEALTH CARE PROFESSIONAL

- Remind participants that their health care providers are the best source of up-to-date information about medical options.
- ***Emphasize that medical therapy is not enough! A healthy lifestyle should be part of any prevention or treatment strategy!***

