

Kentucky Osteoporosis Prevention and Education Program

MISSION AND VISION

Mission: The mission of Kentucky's Osteoporosis Prevention and Education Program is to raise public and provider awareness of the causes, prevention, diagnosis and treatment of osteoporosis.

Vision: Our vision is to reduce the rate of osteoporosis by observing earlier detection and treatment eliminating related deaths and disabling fractures due to osteoporosis.

ACKNOWLEDGEMENTS

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Information has been provided on oral health and osteoporosis with permission by Dr. James Cecil.

KEY POINTS FOR COMMUNITY EDUCATION

This document can be used to assist community educators in training on preventing osteoporosis and its disabling fractures. The primary message in preventing osteoporosis and fractures is healthy lifestyle choices. The materials provided in this tool kit 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.

Educators should not give medical advice or endorse any specific medical product or medication.

Slide Presentations: There are 5 separate presentations to assist with having materials and slides ready for different audiences. The following presentations are included in the “tool kit”.

- Youth (age 9 to adolescent)
- General Audiences/Post menopausal women- in depth (long version)
- General Audiences/Adults- (45 minute)
- General Audiences/Adults (30 min)
- Mature Adults (Age 60+)

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 the activities, it is recommended that at least some interactive activities be included in order to maintain interest and enhance learning.

The educator is responsible for tailoring the presentation to meet the participants' needs and to fit information within the allowable time. Educators should be selective in deciding what information to present.

The length of time for a presentation will vary depending on the size and type of the audience, but typically a presentation should last 30 - 45 minutes. 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 Presentations are designed for different age groups. The following suggestions may be helpful in adapting a presentation to a specific audience.

Children and Youth: Presentations to children and youths should be interactive with activities to hold their interest. Emphasis should be on *nutrition, exercise, and building bone*. Include information on how to get adequate calcium in your diet each day through meals and snacks. It is also important to emphasize the risks of excessive dieting and exercise especially for the adolescent age group.

Women of Childbearing Years (age 19 – 44 years): 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.

Middle-aged women: (Age 45 – 59) 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.

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.

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.

OSTEOPOROSIS

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.

KENTUCKY STATISTICS

According to the **National Osteoporosis Foundation's** Kentucky's figures for 2002,

- 128,000 women in this state had osteoporosis and
- 342,000 had low bone mass.
- Another 37,300 men had the disease and
- 223,400 men had low bone mass.
- 834,000 Kentuckians are expected to be affected by this disease.

Osteoporosis can have both painful and life-altering consequences, particularly among those who suffer hip fractures. In many cases, people who suffer this type of injury die within 12 months, usually from complications such as pneumonia or blood clots in the lung.

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.).

Additional 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% will need long-term care facilities.
- There is a 20% increased risk of death from complications in the first year following the hip fracture.
- At least half of those over 65 years old need help with daily living activities.

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.

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.

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).

Additional 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.

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.

HEALTHY 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.
- 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-subside 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.

Additional Information

- 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.
- 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.
- 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

- **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.

Additional 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.

Additional 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

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:

Kinds of Calcium Elemental Calcium

- 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.

*Recent research is

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. 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! Refer to the Exercise Guide in the “tool kit” on the CD

Point out to the audience that another way to increase bone retention of calcium and promote bone health is through exercise. See exercises listed in *Exercise Guide* on CD and *Brainstorming Physical Activities/ Discussion*.

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

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.

*Picture on slide in presentation for “Mature Adults”.

Assist the audience in listing possible and common hazards in the home:

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

“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*

Additional 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 r 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.

Additional 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

Additional information:

- Decreased bone density is 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

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

MEDICAID

- Kentucky's Medicaid program should 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

- Estrogen "ERT"
- Fosamax® also known as Alendronate.
- Actonel® also known as Risedronate.
- Boniva® also known as Ibandronate.
- 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%.

Additional 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.

BISPHOSPHONATES

- Currently, three **bisphosphonates** – (1) Alendronate (Fosamax®); (2) Risedronate (Actonel®); and (3) Ibandronate (Boniva®).
- Specifically designed to affect the skeleton, by increasing bone density and reducing the number of fractures.
- Fosamax® and Actonel® - 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.

ACTONEL® - (Risedronate)

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

BONIVA® - (Ibandronate)

- Boniva was recently approved by the Food and Drug Administration (FDA) to treat or prevent osteoporosis in women after menopause.
- Boniva may increase bone mass by slowing loss of bone and
- May help lower the chances of breaking bones.
- Boniva is the first-ever once-a-month drug treatment for postmenopausal osteoporosis.

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.

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.

Community Educator

- 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!