

***Osteoporosis: A Women's Health Issue***

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## **Introduction**

Osteoporosis is a bone disease that is prevalent in the female population. The costs to both the individuals inflicted with it and the medical field are astronomical, considering that the disease is almost entirely preventable. It is now considered a major women's' public health issue, and the topic of much research to date. The following literature review will document some of the history, background, and latest research focusing on this bone disease. To conclude the assessment, an overview will be conducted on two intervention methods that focus on the prevention and/or maintenance of osteoporosis.

## **The Definition of Osteoporosis**

Osteoporosis is the most common of the metabolic bone diseases, and literally means "porous bones" (Sanborn, 1990). The three areas of the human body that are most susceptible to this disease are the wrist, hip, and spine.

The human skeleton is made of 20% bone that resembles a honeycombed appearance, called cancellous, or trabecular bone. The remaining 80% is much more dense matter, known as cortical bone. Bone undergoes a continuous remodeling process throughout the life span, of resorption and formation (Sanborn, 1990). Peak bone mass (PBM) is reached by humans in the early to mid thirties (Sanborn, 1990; Carrie Fassler & Bonjour, 1995), and so reaching the maximum PBM is ideal for reducing fractures in the later stages of life. Women especially are susceptible to these fractures; at age 80 a women will have lost approximately 47% of trabecular bone mass compared to the male of the same age, who will lose only 14% (Notelovitz & Ware, 1985). During menopause,

women lose cortical bone at an accelerated rate, accounting for a 10-15% reduction in cortical bone mass loss (Genant, Baylink, and Gallagher, 1989). This is mainly associated with the loss of estrogen once menopause occurs. This is one reason why the disease remains a woman's health issue.

### **The Prevalence and Statistics of Osteoporosis**

One out of every four Canadian women over the age of 50 has osteoporosis (Nutrition Action, 1998). In Canada each year, 75,000 people break a bone because of this same disease. In America, 25 million people are affected by this disease (McBean, Forgac, and Finn, 1994). McBean et al. (1994) also stated that;

- ◆ Nearly half of all women over the age of 50 will suffer from a fracture related to osteoporosis;
- ◆ This disease leads to more than 1.5 million fractures a year, including painful and often crippling hip fractures;
- ◆ Of those with hip fractures, 20% will die within a year, and half of the survivors will never walk independently again;
- ◆ Osteoporosis incurs nationwide annual medical costs of \$10 billion.

Because of the irreversible affects of this disease once it strikes, the financial cost to the medical field, and the increased prevalence among the female population, much research is being done on the preventive and treatment methods of the disease. These alarming statistics show a demand for action and programming which supports the communities and which can create awareness for the issue. Working with the community members, health professionals can

develop interventions specific to their community, but how must they go about it? Where do you start? The following section explains the broad assessment of a community and/or population that is invaluable to any program design.

### **The Health Promotion Approach**

The statistics prove that osteoporosis is a major health issue, which all professions in the field should be aware of. However, many feel it is not a disease which requires immediate attention because of the late onset in the life span, and often symptoms go unnoticed until it is too late and a fracture occurs. Drugay (1997) found in a Gallup survey of women 74% had not discussed the topic of osteoporosis with their physician, 71% of the women with increased risks for the disease had not discussed it with their physicians; and 90% of the women surveyed had no idea that death was a possible outcome of this debilitating disease. How important is this disease to the public? To the medical field? How can we increase awareness? It is important to first assess the disease for what it is, and determine who is at risk, when, and how can it be reversed. Drugay (1997) provides such an assessment in her health promotion approach to osteoporosis.

#### ***Assessing Health Risks***

Drugay (1997) begins the approach by looking at ensuring health professional are familiar with, and understand the risks associated with osteoporosis. It is important to note that risks do not guarantee fracture or disease, but they do provide guidelines for what to watch for. Table 1 provides a detailed look at the lifestyle factors associated with osteoporosis. Table 2 outlines some of the medications which can lead to decreased bone mass.

**Table 1: Risk Factors of Osteoporosis**

Female gender  
Thin, small frame  
Caucasian or Asian race  
Family history  
History of fractures especially spine, hip, or wrist  
Early menopause (before age 45)  
Low calcium diet  
Sedentary lifestyle  
Excessive alcohol intake  
Cigarette smoking  
Use of certain medications  
Amenorrhea  
Anorexia nervosa or bulimia  
Prolonged inactivity or immobilization

**Table 2: Medications Associated with Osteoporosis**

Glucocorticoids  
Phenytoin and barbiturate anticonvulsants  
Thyroid hormones  
Loop diuretics  
Antimitotics, especially methotrexate  
Cyclosporine A  
Aluminum containing antacids  
Gonadotropin releasing hormone analogues  
Heparin  
Cholestyramine

*Source: Medications & Bone Loss: Are you at risk for osteoporosis? National Osteoporosis Foundation, Washington, D.C.*

The Osteoporosis Society of Canada (1996) lists additional risks of developing the disease as the following; being age 50 or older, experiencing prolonged hormonal imbalances, having the ovaries removed, having limited exposure to sunlight or insufficient Vitamin D in the diet, and consuming high caffeine amounts (consistently more than three cups per day). Understanding the factors associated with this disease is a crucial step in diagnosing individuals at risk.

### **Prevention**

Drugay (1997) explains that the most important preventative treatment is maintaining bone integrity for as long as it is possible. Other research looks at not only preventing the disease, (building bone density), but also treating the disease once diagnosed (maintaining the bone density). As the next section of this paper discusses, simple lifestyle factors that are adopted early in life can possibly prevent the disease in the future.

### **Early Detection**

Bone mass can be measured two ways: through bone mineral content (BMC), or bone mineral density (BMD) (Carrie Fassler & Bonjour, 1995). These can be estimated throughout the entire skeleton, or at specific sites. The most commonly tested sites include the wrist, hip, and spine, and values are computed as T-scores, and Z-scores (Drugay, 1997). The T-score compares the subject's values with normal young adults for peak bone mass comparisons; the Z-score compares the subject's values with sex and age matched controls. The following tables provide an overview of the testing of bone mass.

**Table 3: Use of Bone Density Testing**

Appropriate use of bone density requires careful definition of the clinical questions to be answered by the test. BMD measurements can be used for the following:

- ◆ To establish a diagnosis of osteoporosis
- ◆ To predict future fracture risk
- ◆ To monitor changes in BMD due to medical problems or therapeutic intervention

*Source: National Osteoporosis Foundation. (1996). Osteoporosis Clinical Updates, (3), 2.*

**Table 4: Diagnostic Criteria for Bone Mineral Density Values**

Normal	value > 1 SD of the young adult mean
Osteopenia	value between 1 SD and 2.5 SD below the young adult mean
Osteoporosis	value > 2.5 SD below the young adult mean

Sanborn (1990) discusses the three basic radiographic techniques for measuring bone; single photon absorptiometry (SPA), dual photon absorptiometry (DPA), and quantitative-computed tomography (QCT).

*SPA:* This method is used for bone mass measurements in the radius of the appendicular skeleton.

*DPA:* This tool is used for measuring the lumbar spine, the proximal femur, and the total body. The dual energy x-ray absorptiometry (DEXA) is a modification to the DPA and allows for shortened scanning times, reduction in radiation exposure, better precision, and higher resolution images.

*QCT:* This can be used to measure bone mineral content of the spine. Unlike the DPA, which measures the whole vertebral column, the QCT scans only small areas of the trabecular bone along the vertebral column. A drawback to the QCT is the large radiation dose.

Unfortunately, one of the issues in diagnostic measures is accessibility.

Can all women get tested early enough to still treat the disease? Most likely not, and this is the issue which health professionals must face and solve. Creating public and legislative change and awareness is an important development a community can take to allow for accessibility. Looking at urban and rural areas that lack in medical diagnostic tools and financial assistance for this disease is also an item that could be looked at. Research up to this point is limited in this area but could be a definite future direction.

### ***Treatment***

Durgay (1990) continues with her health promotion approach to osteoporosis by outlining the treatment methods of the disease from a medical perspective. Hormone replacement therapy (HRT), non-hormonal drugs (Fosamax & Miacalcin), and estrogen substitutes are all discussed briefly.

The second half of this paper will look at two interventions focused on the prevention and treatment of osteoporosis on a broader scope. Hormone replacement will be outlined briefly. For more information on the other medical approaches to this disease, please see the source (Durgay, 1990).

## **Interventions**

Interventions focusing on osteoporosis can be looked at from two perspectives: (i) the building of bone mass during the youth and early adult years, and (ii) the maintenance of bone during the later stages of adult hood, and postmenopausal women. The author has chosen to look at two broad interventions: (i) health education and (ii) policy change.

### ***Health Education***

Increasing the awareness to a health issue, such as osteoporosis, can be a challenge. Health education is one direction a health professional can take. Preparing handouts, brochures, and literature is one medium for educating the public; seminars, workshops, and forming support groups is another. Looking at the particular learning styles of adults is a concern an educator will have to take, as everyone absorbs information differently.

All methods of health education have their strengths and limitations, however, an intervention approach should accomplish the following in regards to osteoporosis;

1. identify those at greatest risk for its development;
2. be comprehensive;

3. begin early enough to make a difference; and
4. avoid placing patients at risk for serious iatrogenic disease (White, 1986).

Women must first know what the issues are in relation to the risks discussed previously, and the lifestyle factors that one can adopt or improve on for the prevention of this disease. Appendix A provides a small collection of some health education materials available at health facilities from professionals in the field. The following section discusses health education in regards to osteoporosis and the lifestyle factors that can contribute to prevention.

### ***Nutrition***

Calcium consumption is one of the most important nutritional factors related to increasing or maintaining BMD. There are two issues to look at when discussing the relationship between nutrition and osteoporosis: (1) consuming adequate calcium intake, either through dietary sources, and/or calcium supplements; (2) avoiding factors which adversely affect calcium absorption and/or excretion (White, 1986). Currently, many do not know what an adequate calcium intake is, what it means, and how to incorporate the numbers into a healthy diet. Many recommended dietary intakes (RDI) differ among countries as well, take the guidelines for both the American and Canadian recommended calcium intakes for example;

**Table 5: Comparison of Calcium Requirements**

<b>Age</b>	<b>American Requirement*</b>	<b>Age</b>	<b>Canadian Requirement**</b>
<b>Birth-6 months</b>	400 mg	Birth-4 months	250 <sup>a</sup> mg
<b>6 months-1 year</b>	600 mg	5-12 months	400 mg
<b>1-5 years</b>	800 mg	1 year	500 mg
<b>6-10 years</b>	800-1200 mg	2-3 years	550 mg
<b>11-24 years</b>	1200-1500 mg	4-6 years	600 mg
<b>Pregnant/ breastfeeding teenagers</b>	1600-1900 mg	7-9 years	700 mg
<b>Pregnant/ breastfeeding women</b>	1600 mg	10-12 years M F	900 mg 1100 mg
<b>25-49 years, men and Women</b>	1000 mg	13-15 years M F	1100 mg 1000 mg
<b>50-64 postmenopausal on estrogen no estrogen</b>	1000 mg 1500 mg	16-18 years M F	900 mg 700 mg
<b>25-65 men</b>	800-1000 mg	19-24 years M F	800 mg 700 mg
<b>65+ years, men and women</b>	1500 mg	25-49 years M F	800 mg 700 mg
		50-74 years	800 mg
		75 + years	800 mg
		Pregnancy (additional) First trimester Second trimester Third trimester	200 mg 200 mg 200 mg
		Lactation (additional)	200 mg

\*Source: National Academy of Sciences (1997)  
\*\*Source: Health Canada. The Report of the Scientific Review Committee: Nutrition Recommendations. 1990.  
<sup>a</sup> infant formula with high phosphorous should contain 375 mg calcium

A recent source now shows that 1200-1300 mg is now recommended for both males and females between the ages of 9-18, 1000 mg for ages 19-50, and 1200 mg for 50+ years old (Nutrition Action, 1998). The next question is how can the public use this information and apply it into their own lifestyles?

For many, getting enough calcium is tough. Milk products are the best source of calcium, but can we consume enough? And what about those who are lactose intolerant? At present, Canada's Food Guide recommends 3-4 servings of milk products per day for youths aged 10-16, 2-4 servings for adults, and 3-4 servings per day for pregnant and breast-feeding women (Health Canada, 1992). The following table gives an example of a serving and the calcium content;

**Table 6: Calcium-Rich Foods**

<b>Food</b>	<b>Serving Size</b>	<b>Mg Calcium</b>
<b>Sardines with bones</b>	<b>3 oz.</b>	<b>372</b>
<b>Low-fat milk (2% fat)</b>	<b>8 oz.</b>	<b>352</b>
<b>Skim milk</b>	<b>8 oz</b>	<b>296</b>
<b>Yogurt</b>	<b>8 oz</b>	<b>272</b>
<b>Collard greens</b>	<b>½ cup</b>	<b>145</b>
<b>Spinach</b>	<b>½ cup</b>	<b>126</b>
<b>Corn Muffin</b>	<b>1</b>	<b>96</b>
<b>Creamed cottage cheese</b>	<b>¼ cup</b>	<b>58</b>

*Source: White (1986)*

It is shown that 34%-65% of young Canadian women may not be meeting their recommended calcium intake (Chapman, 1994). Many foods inhibit calcium absorption as well, for example: high consumption of protein, oxalates, phosphate, sodium, and caffeine (White, 1986; Nutrition Action, 1998).

The next suggestion would be supplement use, which most dietitians will recommend if an individual is not meeting their calcium requirements. Choosing a supplement is another task. Most are absorbed the same, about 30%, while calcium citrate malate is superior with 35% absorption (Nutrition Action, 1998). Some examples of calcium supplements are as follows (White, 1986);

Calcium carbonate [Oscal, Cal-Sup, Tums antacids]

Calcium lactate [tablet form]

Calcium gluconate [tablet form]

### ***Physical Activity***

Weight bearing and strength training exercises have been shown in the research to play a significant role in building bone mass, as well as maintaining it (White, 1986; Sanborn, 1990; Munnings, 1992). In research studies of both elite athletes and recreational athletes, bone mass has been found to be greater in the exercises compared to their sedentary controls, and bone loss has been retarded due to the exercise routine (Sanborn, 1990). Combined with calcium consumption, either through dietary or supplement sources, and estrogen therapy, women can maintain their bone mass; young women who participate in activity can increase their PBM and prevent fractures in the future (White, 1986; Sanborn, 1990). A typical weight bearing exercise could include walking, aerobic dance or step, and dancing; strength training includes weightlifting and calisthenics. An exercise guideline to follow is 30-50 minutes 3-5 times per week of heart-raising activity, either in the form of walking or aerobic exercise, and 2-3 strength and conditioning workouts per week, which results in building strength.

***Lifestyle behaviors- smoking, alcohol***

Smoking has been shown to increase the excretion of calcium through the urine thus preventing absorption; and alcohol consumption is associated with poor nutrition status, thus leading to low consumption of the mineral (White, 1986). These two habits are risk factors that women should be familiar with and avoid if possible to prevent the disease, and other health problems associated with their intake (cancer, asthma, liver damage, etc).

***Hormone Replacement Therapy (HRT)***

The preventative factors discussed thus far relate to lifestyle behaviors that can be adopted and maintained with some confidence and positive outlook on health. The medical approach to osteoporosis prevention and treatment is another option but also leads to further concerns and questions; hormone replacement therapy is one which many women question. However, HRT may be one of the most important decisions a woman will make in her life.

HRT is prescribed to women who are postmenopausal or lack ovarian function to compensate for the estrogen lost during this period. A link is associated with decreased estrogen loss and increased bone loss (Loach, 1998). Many professionals agree, that the replacement of this hormone is invaluable in maintaining bone density for the female population. If a woman is not taking HRT, her ability to absorb calcium drops dramatically at menopause as a result of falling estrogen levels (Finn, 1998).

The concern and confusion for taking it stems from research done by the Imperial Cancer Research Fund (1997) which associated HRT with specific cancers. Individuals should consult their physicians when contemplating a HRT, and the decision should consider the woman's risk of heart disease, breast cancer, and osteoporosis (Prestwood, 1997). The benefits and costs should be carefully weighed out when making such a decision.

HRT has the potential of decreasing spine fracture by 70% and hip fractures by 50% (Prestwood, 1997). Long term research on the association of HRT and osteoporosis is limited, but in one study, HRT was shown to prevent

bone loss and fractures when taken over a period of 7-10 years (Prestwood, 1997).

When choosing a specific hormone and regimen, two items must be looked at;

- (1). The amount of estrogen prescribed must be great enough to maintain bone;
- (2). Other hormones, such as progesterone, must be considered in terms of buffering the side effects and risks of estrogen (endometrium hyperplasia, cancer, etc).

Conjugated equine estrogens and synthetic estrogens are the most commonly prescribed source of the hormone (White, 1986). Regimens are most often based on a calendar day, and many are multiphasic (combining estrogen and progesterone), similar to an oral contraceptive. For example: days 1-25 involve estrogen intake, days 16-25 involve progesterone intake, and days 26 to month's end are drug free (White, 1986). It is suggested to start on HRT in moderate doses and increase gradually to prevent and/or alleviate any symptoms related to the hormone: edema, cramping, bloating, irritability, and breast tenderness.

#### ***Relevant Research***

Once the risk factors and preventative measures are developed into health education practice and application, how does one know if it actually works? Some recent research has shown that health education plays an important role in educating the female population about this disease; both the young and old.

### [1.] Osteoporosis prevention in young women

In a recent study by Sedlak, Doheny, and Jones (1998) the purpose was to assess whether young females demonstrated higher levels of knowledge regarding osteoporosis prevention with a health education program versus a control group who did not. The subject group included a female population from a university campus with a mean sample size of 13 for the control group and 18 for the treatment group. The majority of the sample group fell between the ages of 18-19 years.

The treatment groups met with the research team a total of three times. The first meeting involved a small pretest with questions regarding osteoporosis knowledge, health beliefs, and self-efficacy (the control group went through a similar routine to assess baseline knowledge). The following two meetings involved the education program from the Osteoporosis Foundation (1993). It included instructional material, a slide show, and a discussion followed. Calcium rich foods were served for snacks.

At the end of the sessions, both treatment and control group participated in the posttest, which was exactly the same as the pretest. This test is a 24-item multiple-choice questionnaire regarding knowledge of osteoporosis. A 12-item magnitude scale which measured confidence in conducting activities related to osteoporosis prevention with an emphasis on exercise and dietary intake of calcium was also included in both the pre- and post-test.

The results showed that the experimental group had higher scores on the knowledge test after the education program, and they showed a significantly greater increase in total health belief; the knowledge of the benefits of exercise

and calcium intake as preventative measures increased, and the treatment group gained a greater understanding of the susceptibility of osteoporosis in regards to their own personal lifestyle. The results for this study can be seen in the following table.

**Table 7: Mean Knowledge Scores and Standard Deviations about Osteoporosis by Group at Pretest and Posttest**

Control Group N=13			Treatment Group N=18		
Knowledge Score	PRE	POST	Knowledge Score	PRE	POST
	14.53 (SD= 3.31)	15.77(SD=3.14)		15.50 (SD=3.03)	20.83 (SD=1.47)
<i>The Knowledge Scale has 24 items for a potential perfect score of 24. The reported values are means.</i>					

Limitations to this study include the fact that the sample group was quite small and well educated. Future research should include a large sample group with varying education levels and differing backgrounds. A future direction for research would be to also look at the types of teaching materials suitable for various age and education levels. The following research review gives the results of a health education program focusing on an elderly population.

**[2.] Effects of nutrition education on calcium intake in the elderly**

In a study by Constans, Delarue, Theret, and Lamisse (1994) the elderly were the subject group for a health education intervention. The sample size included 54 individuals over the age of 60 who gave seven-day diet histories to a registered dietitian. Those individuals with calcium intakes below 800 mg were used as the treatment group, and those with calcium intakes greater than 800 mg per day were the control.

The treatment group was provided information on how to increase their calcium intake in the form of handouts. These included tables of calcium rich foods and information regarding osteoporosis. A dietitian met the control and treatment groups two years later, when seven-day diet histories were taken again.

The results can be seen in the tables below. The intervention group showed increases in milk and yogurt consumption. The calcium intake was increased, while energy levels generally stayed the same. The calcium increase was associated with an increase in milk consumption; women showed a significant increase in this area.

**Table 8: Mean and range of calcium intake (mg) in the intervention group (13 men and 23 women) and nonintervention group (11 men and 7 women) in 1988 and 1990**

	Intervention Group N=36				Nonintervention Group N=18			
	1988		1990		1988		1990	
	<i>Mean</i>	<i>Range</i>	<i>Mean</i>	<i>Range</i>	<i>Mean</i>	<i>Range</i>	<i>Mean</i>	<i>Range</i>
<b>Men</b>	565	305-789	622	382-976	1145	816-2860	847	464-1136
<b>Women</b>	597	421-797	751	474-1170	1015	897-1341	1045	814-1284
<b>Both Sexes</b>	586	305-797	705	382-1170	1095	816-2860	924	464-1284

Source: Constans et al. (1994).

**Table 9: Energy intake and weekly dairy food consumption in the intervention group in 1988 and 1990**

Variable	1988	1990
<b>Energy intake (kcal/day)</b>		
<i>Men (n=130)</i>	2001	2040
<i>Women (n=23)</i>	1711	1754
<i>Both Sexes</i>	1816	1845
<b>Dairy Food Consumption (both sexes)</b>		
<i>Milk (ml/wk)</i>	461	823
<i>Fermented Cheese (g/wk)</i>	150	137
<i>Cooked Cheese (g/wk)</i>	52	67
<i>Yogurt (g/wk)</i>	608	700

In summary, health education based on creating awareness to the above risks to osteoporosis is a typical intervention many health professionals should incorporate in their routine. The research shows, although limited, that this approach can prove to be useful for various age groups. What type of health education works best for which age group is a future direction research can take.

### ***Policy Change / Joint Collaborations***

#### ***The Recommended Daily Intake of Calcium***

Determining the calcium requirement of the adult female is a vexing problem for many in the nutrition field. Much of the concern is due to the association of its consumption to osteoporosis, a major public health issue (Draper, 1987).

Much of the research and recommended intakes of the past are concerned with more of a homeostasis versus a prevention approach. The most recent research shows that the typical RDI of 800 mg may not be enough. Most health professionals now agree that 1000-1200 mg per day of calcium is an adequate amount to assist in prevention; 1500 mg is the highest RDI for men and women during the later years of life (Nutrition Action, 1998).

Having the Canadian RDI's increased is one policy change which the professionals are acting on as an intervention to prevent this disease. The next step to this is to make the public aware so that the information can be applied. The dietitian can play a key role in applying the food guide and food groups to levels of recommended calcium intake appropriate to the person.

### ***The Professional Commitment***

Another major intervention is having professional bodies and/or corporations, businesses etc work together to increase awareness to the public. Financially, the benefits far outweigh the costs, and having the power of a group collaboration could have more “pull” at the policy and legislative issue and create “buy-in” from the public.

The best groups to be involved in these collaborations are nutrition organizations since the dietitian play a huge role in health education of the disease. Examples of this includes the collaboration of the American professional body, the American Dietetic Association (ADA) with the National Osteoporosis Foundation in supporting the Osteoporosis Risk Reduction Act of 1994 (JADA, 1994). The goal for this collaboration is to increase awareness of the relationship between nutrition and osteoporosis. This proposed legislation would direct the US Food and Drug Administration to:

- review the relationship between calcium intake, bone mass, and osteoporosis;
- identify how many Americans are consuming too little calcium and determine how much their calcium intake must increase to reduce the risk of osteoporosis effectively;
- develop guidelines, as appropriate, for the fortification of bread, cereal, and other grain products with calcium.

This collaboration is powerful in its ability to affect so many individuals, and creates a win-win situation for both groups involved. The research to date is

limited on information regarding Canadian collaborations. This can definitely be a future research direction.

In 1993, the ADA collaborated with the National Dairy Council to hold a conference titled “Osteoporosis: Visions for Care and Prevention”. Experts from across the field discussed and presented recommendations and ideas on prevention and treatment of the disease (JADA, 1994). This is an example of another powerful collaboration to increase public awareness.

The purpose was not only to increase awareness but create action within the U.S.A. Myths were dispelled, objectives were created, and recommendations made. To help effectively market the osteoporosis story, some recommendations were made to dietitians (JADA, 1994);

- learn what the media wants;
- learn to sell behavior change, not just teach the facts. This requires listening to consumers and finding out what motivates them;
- tie the osteoporosis message into the newly approved health claims on calcium and osteoporosis on food labels and/or to the Women’s Health Initiative;
- use a celebrity as a spokesperson to motivate people;
- learn to speak in 10-word sentences; and
- think from the perspective of your neighbor or mother-in-law.

These points bring about some interesting perspectives. Dietitians must keep the message simple yet applicable, and learn about the individuals they are consulting, not just their name.

## **Conclusion**

Osteoporosis is an issue that needs to be looked at through a broad perspective and a health promotion approach. It is important that the female population is made aware of the risks, the prevention methods, and the options they have. It is important that health professionals also understand the risks and are looking for them in the clients they consult. Creating interventions that assist in this matter should be a priority for the medical and related professions. With health education, joint collaborations, and the goal of policy change, many of the issues discussed previous can become part of a community agenda and create involvement which reaches out to all that are at risk.

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