Effect of Exercise in
Postmenopausal Women with
Osteoporosis
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Introduction
Osteoporosis has often been described as
the silent disease. The reason is because
your body does not exhibit any signs or
symptoms as your bones weaken. The
only time you would realize that you
might have osteoporosis was when you
fractured a bone, this fractured bone
might have been caused by something
very simple such as sneezing or by
bending down to pick up something.
Approximately, about 10 millions people
in the United States suffer from
osteoporosis and about 18 million others
are at risk. Of these 10 current million,
8 million are women and only 2 million
are men. By these statistics you can see
that osteoporosis affects far more
women than men. As women age,
different changes in their bodies take
place over time. One of these changes is
a decrease in estrogen level. This
decrease has been associated with a
reduction in bone mass density. Low
bone mass has been linked to a variety of
bone fractures the must serious ranging
from hip fractures to vertebras fractures.
Most of these fractures have come from
falls due to poor postural stability and
weak bones. Bone loss is detrimental to
the quality of life of postmenopausal
women since it hinders the ability of
these women to perform simple tasks of
daily living.

Biomechanics/
Mechanisms/Explanation
The primary job of the bones is to
provide structure, anchor muscles,
protect organs and store calcium.

Adequate calcium intake and weight
bearing exercises build strong bones,
increase bone mass and may even reduce
the risk of osteoporosis later in life.
Once women reach a certain age (50),
the sex hormone produced in the ovaries
known as estrogen start to decrease, this
decrease in hormone is characterized as
menopause. Studies have found that
women have the highest bone loss
during their first three years after
menopause, and then continues at a
slower rate.
As you look at the surface of a bone, it
seems to be very solid and static, but this
is not the case. Bones consist of two
types of tissue, compact bone and
traebecular bone. Compact bone forms
the dense outer casing, while trabecular
forms the interior. These two bones are
made up of a meshwork of collagen
fibers; this meshwork is made up of
calcium and phosphate. These two
substances are mixed with water to form
a hard cement-like substance called
hydroxyapatite. Sodium, potassium and
magnesium also exit in smaller amounts.
These different materials are what make
bone so strong. These minerals are in
constant change being continuously lent
out and replaced. These minerals are in
constant change being continuously lent
out and replaced. The main mineral in
bones is calcium. The process by which
calcium is released from the bones is
known as resorption. This process is
carried out by cells called osteoclasts.
Osteoclasts are scavenger cells that
attack intact bones and dissolve
hydroxyapatite and break down collagen
and other proteins. At the same time
they are eating away bones, they are also
regurgitating freed proteins and minerals
into the bloodstream for reuse to the rest
of the body. This recycling effort leaves
tiny tunnels in the bone, if this tunnels
are not filled back by a process known as
formation, which is carried out by
osteoblasts, then the bone will be missing minerals and proteins which are necessary to keep the bone strong. Bones will become brittle and injuries will very likely occur. Brittle bone is what is termed as osteoporosis. The remodeling process of resorption pared with formation is what maintains the skeletal system by replacing old bones with new ones.

Process of Bone Remodeling

Application:
As we all know, mechanical loading greatly contributes with the acceleration of bone mass. Recent studies have shown that the risk of developing osteoporosis is reduced for people who perform weight-bearing activities at least three times a week. Muscles pulling on bone build bone and weight bearing exercise builds denser, stronger bones. The more bone mass women build before the age of 25 to 30 the better of they are when they reach menopause. Though exercise can help women maintain bone density later in life, it should not be considered a cure for osteoporosis. Postmenopausal women who already have osteoporosis should consider and exercise program but also include hormonal therapy and calcium intake in their diet or treatment. Getting enough calcium in your diet plays an important role in the health and strength of your bones.

<table>
<thead>
<tr>
<th>Age</th>
<th>Recommendation</th>
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<tbody>
<tr>
<td>9 to 18 years</td>
<td>1300 mg/day</td>
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<tr>
<td>19-50 years</td>
<td>1,000 mg/day</td>
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<tr>
<td>51 years or older</td>
<td>1,200 mg/day</td>
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<tr>
<td>14-18 years pregnant or lactating</td>
<td>1,300 mg/day</td>
</tr>
<tr>
<td>19-50 years pregnant or lactating</td>
<td>1,000 mg/day</td>
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Conclusion
While bone loss is inevitable for postmenopausal women there are a lot of things they can do to slow down the progression of bone loss and osteoporosis; the idea is to start early. When people are young, they hardly think about getting old, let alone, think about diseases or health problems that exist amongst the elderly. At a young age, parents have a saying in what we eat and in our behaviors. If parents were educated, they could have the ability to help and educate their kids about these elderly problems and later in life avoid or minimize the progression of osteoporosis. By following a healthy
diet, rich in vitamin D, enough calcium intake and regular exercises all these problems could be avoided. Daily exercise, primarily strength training combined with 1200 to 1500 mg of calcium is an excellent suggestion for the prevention of bone loss and osteoporosis.

**Reference**


Simar, L.M., Malesta D., Goulart, M. Response of Bone Metabolism Related Hormones to a Single Session of Strenuous Exercise in Active Elderly Subjects. Sports Medicine, 39, 2005.
