Osteoporosis, what it is, and strategic exercises on how to prevent or maintain it.

Stage 1. Osteopenia – A low bone density reading between -1.0 and -2.5 of the standard average reading for a young healthy adult (above -1.0). Osteopenia can lead to Osteoporosis.

Stage 2. Osteoporosis - Osteoporosis is the thinning of bone tissue and loss of bone density over time with osteoporosis, a bone density reading is below -2.5.

Osteoporosis
Characterized by a reduction in bone mass, osteoporosis is a medical condition resulting in the weakening of the bone, increasing risk of fracture, in particular the vertebra, hip and wrist. It is associated with menopause and advancing age. As we age bone is reabsorbed into the body and osteoporosis occurs when the body fails to form enough new bone.

Causes
The leading causes of osteoporosis are a drop in estrogen in women at the time of menopause and a drop in testosterone in men. Women over age 50 and men over age 70 have a higher risk for osteoporosis. These hormones play many a role including the making of bone.

Calcium and Vitamin D are essential for normal bone formation and without enough or with poor absorption, the bones can suffer. Other factors include, vitamin D deficiency, bed confinement, certain medications, being thin, smoking and excess alcohol.

The Skeleton and exercise
Most of your 206 bones in the body, rely on good nutrients, good health and stress to keep them strong. Physical activity applies stresses on the muscles which in turn apply stress to the tendons and ligaments which pull on the ends of the bones to make your body move. This stress ‘talks’ to the bone encouraging it to keep growing new matrixes of bone. The bone’s core is like a web, very holey but strong. The holes increase with osteoporosis and the support structures of the ‘web’, crumble.
A person carrying a lot of weight all their life is less likely to get osteoporosis than a skinny person; however there are plenty of other health issues associated with over or under weight people! Bed rest is detrimental as is little to no exercise. The correct exercise is most important for prevention and or maintenance.

**Living with Osteoporosis**

Avoid falls  
Keep muscles strong  
Keep eyesight in check  
Check with GP as a cocktail of medications can cause dizziness.  
Walk slowly

**Exercise**  
**For prevention** – As much and as many different exercises as possible – primarily walking, running (for prevention) and weight training; weight training must be in addition to cardio choices as lifting weights directly puts a strain on the joints which stresses the bone to keep replenishing itself. Cycling and swimming are terrific cardio and strength exercises but are secondary as they are not considered ‘weight bearing’. Strength water exercises are good if you have the disease. Practice balance to prevent falls.  
**For maintenance** – Again as much and as varied the type of exercise is important. A variety ensures that not one muscle group or joint will get overuse.
**Contraindicated Exercises** - Maintenance is precisely that; osteoporosis will have set in and now the bones are at risk. Any pounding or pressure exercises will be detrimental to the bones so walking is preferable to running as would be abdominal exercises in a chair with resistance bands be preferable to lying on the floor doing sit-ups as the vertebrae can crush. Twisting movements such as a golf swing can also cause fractures. Daily activities such as bending to pick up objects can cause vertebral fracture and should be avoided.

**Exercises for Prevention**
1. Warm up, walk, dance, jog
2. Low to high impact cardio such as dance/jogging
3. Weight room machines for hips, high, mid and low back, leg press, squats, chest presses.

**Exercises if you have Osteoporosis** An exercise program for people with osteoporosis should specifically target posture, balance, gait, coordination, and hip and trunk stabilization rather than general aerobic fitness
1. Gentle warm up (walking, dancing
2. Balance using chair/wall for support
3. Walking on different surfaces using walker/cane/wall for support
4. Isometric back exercises using rubber bands in a row type movement
5. Trunk training sitting supervised on large training ball or just holding spine upright on chair.
6. Shoulder strength exercises, best in the water

**Food for Osteoporosis**
Bone is mainly made up of calcium and needs vitamin D to support its health and strength. Bones can act as a ‘bank’ and give up some of its calcium to the body for other functions; when you ‘deposit’ calcium, say in dairy products, it ‘pays’ back the debt. If you don’t have the greatest diet, this deficit grows causing the bone to weaken.

**Quantities**
RDA is 1000-12000 mg of calcium daily with the upper limit being 2500mg daily.

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<th>Women</th>
<th>Calcium (mg/day)</th>
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<td>Calcium (mg/day)</td>
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<td><strong>Women</strong></td>
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<td>19 years to menopause</td>
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<td>Post-menopause</td>
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<td><strong>Men</strong></td>
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<td>19-65 years</td>
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<td>65+ years</td>
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But taking supplements can cause issues with too much calcium causing issues such as kidney stones. So please take calcium in the diet first.

**Foods**

**Calcium.** All milk products (cheeses, ice cream, yogurt, milks) regardless of fat content. Keep to non or low fat for heart healthy.

Bok choy, soy beans, kale, collard greens, broccoli, white beans and almonds to name but a few. See attached list.

**Vitamin D.** Vitamin D is needed to help extract the calcium from the intestine. Because the sun provides vitamin D there is no firm RDA for it but an older person might be prescribed as much as 20-25g daily (see GP) (twice the RDA in most countries). Not too many foods contain vitamin D. Fatty fishes and fish liver oil, mushrooms (ultra violet light in growth), small amounts in eggs and beef liver. Any foods fortified with vitamin D or calcium.