State College of Florida HUN # 2201 Fundamentals of Nutrition

Class 11 Chapter 18

Diet and Health – Heart Disease, Hypertension, Stroke, Diabetes

Due to **Conquering** major bacteria, such as smallpox, polio and other diseases as well as achieving the purification of many water supplies, the **health** of the people of the US is **better**  than it used to be. It is also better than many other countries of the world, especially Asia and Africa. The four **main causes of death** in the United States are identified in Figure 18-2 in the textbook.(Whitney 585) They are **Heart Disease, Cancer, Lung Disease and Stroke**. Along with the seventh ranked cause of death in the US, **Diabetes** , they account for most of the US deaths each year. \*Excepting lung disease, the other four illnesses are considered **diet related** . This means that they can be changed by making better choices of the foods we eat and by making lifestyle changes. **Lifestyle changes** involve decreasing exposure to chemicals, to stop smoking, not using street drugs, limiting alcohol and limiting exposure to air pollution and pesticides. **Moderate exercise** helps to protect the heart from sudden jolts and free radicals. **Genetics,** what we inherit, can influence the initial exposure to an illness, although not necessarily the outcome.

 Good nutrition can over-ride the genes. The textbook Table 18-2 (Whitney 586) shows **risk factors** **for** some **illnesse**s. As a risk factor for cancer and diabetes are low complex carbohydrates and low fiber really means high simple carbohydrates (sugar and foods like white flour and white rice products that convert quickly to sugar) are a risk factor. There is some research that shows that high sugar intake causes **inflammation,** which is **a cause of heart disease, diabetes, cancer and some kinds of poor dental health.** Other information indicates high intake of meats, increases the risk of colon cancer.(Whitney 183) Also, recent research indicates that high intake of lipids including meats and fish oil increases risk of prostate cancer. (Brasky 2013) Is the reason the saturated fats, the lipids, the iron, the growth hormones residue. It is not yet known.

But **Foods can protect** us against illness. Some foods and nutrients affect several diseases. See the discussion of phyto-chemicals and **functional foods** in the textbook

in the Highlight after Chapter 13.(Whitney 428-434) See Table H13-1 Phytochemical Food Sources and Action and Table H 13-2 Phytochemical Foods by Color There are pictures and information about these powerful, nutrient dense foods.

 **Heart Disease** or Cardiovascular Disease is caused by **damage to** or **clogging of** the arteries, which carry blood from the heart. If the arteries are clogged, the blood **cannot travel to the lungs** to get oxygen. The blood builds up in the heart and causes an enlarged heart. **Without oxygen**, breathing problems get worse and people need to carry oxygen with them. To prevent this, **increase antioxidant** foods, that contain Vitamins A,C & E. People also need to **decrease saturated fats** and increase fish oil and olive oil. Also, research shows that eating leafy green **vegetables**, that contain vitamins B6, B12 and Folic Acid help. See Table 18-5, Strategies to Decrease Risk of Chronic Heart Disease. (Whitney 593)

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\*\*Small amounts of alcohol, garlic and moderate exercise after the high fat meal, will help to **circulate the fats** from the meal. This will help to keep the fats from clogging the arteries. Also, taking or absorbing **vitamin D** will transport calcium to the right places. This will keep calcium from being deposited on artery walls, which would also clog the arteries. Adequate **magnesium** would relax the heart muscle and arteries, which would increase circulation and decrease heart disease. Eating less of meats and more legume beans would decrease risk of heart disease. See the How To Section in the textbook: How To Implement a Heart Healthy Diet (Whitney 594)

**Hypertension** or **High Blood Pressure** , occurs when the heart has to pump harder and faster. It is another cause of heart problems. This is caused by stress and **too much salt**  which retains **too much fluid** and **creates Potassium and Magnesium deficiencies.**

 Salt “sensitivity” – This means genetically sensitive: too much salt has already been given by the pregnant mother and too much is taken in thereafter.

Studies show that the **DASH** diet, which is a low salt and low saturated fat diet that included 9 servings of fruits and vegetables daily, did lower blood pressure. See Table 18-7, the DASH Eating Plan & USDA Food Patterns Compared. The people also lost weight. It was a helpful diet, although has lost favor with people because they like their salt and doctors prescribe medicines for high blood pressure, which is easier than changing from foods that are preferred. See Table 18-6 in the textbook for Lifestyle Modifications to Reduce Blood Pressure.(Whitney 596)

 **Potassium** deficiency - Symptoms include fluids that are not excreted, leg weakness, unexplained numbness or tingling, leg cramps, excessive thirst and urination and irregular heartbeats (because the person is then not able to pump in magnesium).

**Magnesium** deficiency – Symptoms include heart pain, angina, heart contraction or heart attack and light twitching of nerves, sensitivity to lights and sound.

We need some of each of these minerals, potassium to pump in Potassium, which pumps in magnesium.

Influences on Heart Health

**Markers** are things seen in blood tests that indicate heart problems. These are the build up of **homocysteine**  and **C-reactive-protein**. Both build up in the blood and cause inflammation. Homocysteine can be reduced by adequate vitamins B6, B12 & Folic Acid. C-reactive protein can be reduced by adequate vitamin C.

**Sugar**  and **omega 6 oils**  increase the risk of heart attack because they cause inflammation in the blood going back to the heart. Fish oil and low sugar decrease inflammation and help prevent sudden heart attacks. High triglycerides, sugar and fats together, increases risk of heart (Whitney) Making a few choices at a time can help to make major changes over time. Try to choose breads, cereals and pasta that are made from **whole wheat** that is first on the list of ingredients or at least **whole grains**. Choose products made from **olive oil**. Cocoanut or palm oil are ok (contrary to the textbook as they melt at body temperature.) Highly recommended: consume very low trans fats or hydrogenated oils. Choose lean naturally raised chicken, turkey and pork. Choose fish caught in the wild and have it once per week.

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Choose **low trans fat** and low sodium deli turkey. Have eggs once per week and egg whites sometimes. Choose low fat or skim dairy, depending on your age and situation. **Limit sweets** to special occasions. Make your own desserts, substituting fats with baby prunes and substituting sugar with unsweetened applesauce. Include cocoa, olive oil or yogurt to make brownies or make peanut butter icing for cakes. See the Recipes folder in ANGEL for other suggestions.

**Strokes**

One kind of **Stroke** occurs when a blood clot blocks an artery in the brain and cuts off oxygen to the brain. **Fish oil** and Vitamin E thin the blood and decreases clotting. This helps to prevent strokes. \***High fiber** gets fats out of the intestine so they are not reabsorbed into the blood stream. \*This also prevents strokes.

\*Pressure in the intestines = pressure in the brain. Eating more **whole grain cereals, breads and grains c**an increase magnesium and decrease the pressure in the intestines.

 On the CNN banner, on March 11, 2011 it was reported that research showed that intake of “multiple” cups of coffee decreased the risk of stroke in women. This could be due to the magnesium in coffee beans that would \*relax the intestine and increase peristalsis to decrease the intestine to brain pressure.

 On the NBC evening news it was reported that studies show the high intake of sugary drinks increased the risk of heart attack. Two diet sodas per day increased risk by 42%. ( Williams 9/11/13) Other studies have implicated sugary drinks in increased risk of pancreatic cancer.

 **Smoking** increases heart problems because in the extremities, hands and feet, the parts of our bodies that are furthest away from the heart, is where there needs to be a crossover of the blood from arteries to veins. Nicotene **contracts** these **small capillaries (blood vessels)** so the transfer is more difficult. If the arteries or veins are clogged with saturated fats it combines to make the transfer even more difficult. Therefore, blood can’t return to the heart and lungs as well. The heart tries to pump harder and all parts of the circulatory system are stressed. If the blood does not circulate well, clots form in the blood and the lungs get clogged with the toxic chemicals and fibroid tissue grows in the lungs. **Vitamin A foods and plant based supplements** help the lungs be more flexible but Too Much Vitamin A will make any lung tumors grow.

**Cholesterol**  comes in saturated fats and egg yolks. It can clog arteries. Men eat more beef because it contains more testosterone and therefore they get more cholesterol that is not used up in pregnancy and lactation. One large egg contains on average 200 mg. of cholesterol although contains 72 calories and 6 grams of protein.

 **HDL**  helps because it circulates the cholesterol in the blood. HDL is **increased by:**  aerobic exercise, not smoking, unsaturated oils like olive oil and avocado oil, niacin and garlic. Dark berries like grapes bilberries and blueberries and red wine also **increase HDL and strengthen blood vessels** to be stronger so they pump the blood better and cholesterol and saturated fats don’t stick to the arteries.

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**Magnesium** increases HDL by **relaxing the arteries** making them work better to circulate the fats. A source of magnesium is also moderate amounts of coffee, legume beans and nuts and green leafy vegetables. The metal **Copper** also increases HDL. **Food Sources** are shellfish, whole grains, legumes, meat and also copper water pipes. Vitamin D transports calcium to the right places so that it doesn’t get stuck in the cholesterol and saturated fats to harden in the arteries. \*\***Antioxidants**  – foods that contain vitamins A, E and C keep the cholesterol and saturated fats from getting hard and sticking to the arteries. \*Vitamin C , dark berries and tea will also help to make the blood vessels stronger. \*Vitamin A foods will help to make the blood vessels more flexible.

Estrogen does NOT decrease the risk of heart disease. Modern, 2000 + studies proved it. In fact, too much estrogen increases, among other things, blood clotting and stroke.

**What can help? \*** Eat lots of fruits and vegetables, oatmeal and high fiber cereals. \*These foods soften the stool to communicate to the liver not to produce cholesterol. This can decrease familial cholesterol. Increase fish with oil, eat foods that contain magnesium and potassium. Eat some soy and legume beans, increase olive oil and exercise regularly. During pregnancy maintain adequate cholesterol. Maintain a moderate blood pressure. Have some fun and let love into your life, as it relaxes the heart.

**Diabetes**

Diabetes also increases the risk of heart disease. The same foods help against both problems. Recent information indicates that decreasing obesity can decrease diabetes.

See maps below.

 

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Many people still do not understand that diabetes comes from poor nutrition. It can begin with **hyperglycemia**, which is having periodic high glucose in the blood. If it continues there may be a diagnosis of **pre-diabetes**, which is recurring high glucose in the blood. If it continues, there may be a diagnosis of Diabetes.

Diabetes is classified into types:

**Type 1** Diabetes – means that no insulin is being made by the pancreas. It comes from the pregnant mother eating too much of Sugar foods, including white flour products.

It is usually diagnosed in children under six years of age. It usually results in weight loss.

**Type 2** Diabetes – means that low insulin is being made by the pancreas. It comes from the person eating too much of Sugar foods. It is usually diagnosed over 40 years of age, although now some children are diagnosed with Type 2 diabetes. It usually results in weight gain.

See the chart, Figure 18-5, Consequences of Diabetes, (Whitney 600) that shows how both types progress in several systems of the body.

**Insulin** is secreted from the pancreas, to direct the body to send some sugar to muscles and the liver for storage. It also stimulates fats in the blood to protect the cells membranes. If the pancreas is worn out, no insulin is produced and the sugar stays in the blood. Then wounds and sores do not heal, nerves deteriorate, gangrene sets in, vision deteriorates and sugar is always either high or low. People need medicine to regulate the sugar or insulin to be injected into the blood. Without insulin, the sugar in the blood causes inflammation, including in the brain which decreases memory and other brain functions.

**Prevention –** decrease sugar and white flour products. Eat less fruit alone, rather \*with a \*meal, protein or fiber. Thin out juices and sweet drinks. Increase fiber by vegetables and grains. Eat meals of average portions. Don’t skip meals or the sugar that is in the blood will be more concentrated. If parents have or had diabetes, be extra careful. Research indicates that diabetes increases the risk of colon/rectal cancer and Alzheimers disease. Adequate intake of antioxidants, vitamins A, C and E can counteract the inflammation and oxidation of lipids that otherwise would occur.

**Control –** decrease sugar and white flour products, increase fiber and whole grains. Eat raw and high fiber fruits (like apples, pears, cantaloupe) and vegetables and decrease high sugar fruits, (berries, watermelon, kiwi and vegetables (baked beans) Increase aerobic exercise to increase circulation of the sugar. This will also decrease pooling of blood in the feet and will increase nerve transmission. B vitamins help to strengthen the nerves in the feet. Adequate water increases kidney function which has to work harder to process the sugar. Late stage diabetes that you see in hospitals, involves severe complications in the eyes, heart, blood vessels, and feet and causes kidney deterioration.

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**Cancer**

Healthy **cells divide** into two daughter cells. This replication replaces some cells that are no longer useful. This procedure is regulated by the **p 52 suppressor gene**  If this gene is not working well the **cells keep dividing** and replicating and forming new cells. In some procedures cells just keep growing, as in lymphoma and leukemia, where there are way too many white blood cells. Other times a **tumor grows** .

(Whitney, p. 603)

There are **3 stages** of cancer.

Cancer starts to **Initiate** - those cells become cancerous, out of control cell replication.

Cancer may continue to grow and this is called **Promotion**.

Cancer may spread to other kinds of cells and this is called **Metastasis.**

If a person’s parent or grandparent had cancer it is called having a **family history** of this problem. It is considered **genetic,** just like other things that are given to the child during a pregnancy, from both the father and mother through DNA. This means that the child has a **predisposition** to having this illness. This means that it might happen than the child will have it. It does not necessarily mean that it will. A **healthy immune system,**  beginning with the inner layer of the colon, should screen out cancer causing chemicals. \*A healthy **Thymus gland** will send out cells to destroy cancer cells.

In addition,

**\*Diet influences** all three stages of cancer development. ( Quillan, 1994) I have surveyed extensive research on Nutrition and Cancer and found that:

**Sugar** and **chemicals** initiate and promote tumor growth especially when there is a lack of antioxidants in the diet. Sugar stimulates insulin production which itself promotes growth of new cells. There is some information that lawn **pesticides**, especially in children, increases leukemia. There is some information that being **overweight,** where there is too much **Estrogen,** increases cancer of the breast and ovary. And, that being overweight and a sedentary lifestyle increases cancers of the colon, kidney and prostate.

(Williams) **Alcohol** increases estrogen and increases cancers of the mouth, throat, head & neck, breast, stomach and aggressive prostate cancer. There is some information that high intake of sugary drinks increases the risk of pancreatic cancer. (CNN)

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**\*Stomach bacteria,** as in heliobacter pylori that causes stomach ulcers, is often initiated into stomach cancer. Stomach bacteria is sometimes the result of **poor refrigeration or a diet high in sugar.**  \***Green tea** can help against stomach cancer.

 Skin and lung cancer can also be helped by green tea. Green tea is not to be made with too hot water or it changes chemically to more acid and could irritate the lining of the throat and cause throat cancer.

High amounts of radiation, like that used in radiation therapy, destroys cancer cells. **Low** amounts of **Radiation**, along with a **deficiency of iodine**, disturbs the connection of Hydrogen and Oxygen in the body. That causes **damage to DNA in cells** which can become cancerous. Adequate iodine can help reverse these effects.

 Benign tumors can grow from **high amounts of omega 6 oils** and **saturated fats** often in the prostate and colon. This increases Benign Prostatic Hypertrophy and polyps. They are now considered to be precancerous conditions as they often are initiated into cancer in the prostate or colon by sugar and alcohol in the diet and genetic predispositions. Omega 3 and 9 oils would be better choices.

 Increased intake of pickled and **sodium nitrate,** a preservative in deli meats, increases the risk of bladder cancer. Vitamin C can help protect against bladder cancer.

Frying foods, grilling meat or **heating fats**  to a high degree changes the oils into toxic chemicals. Burned fats are the same. A strong liver is needed to detoxify these chemicals. The Table 18-9 (Whitney 604) of the textbook lists possible reasons for the promotion of cancer in some studies: **Ovarian , breast and uterine and cancers** may be due to **increased estrogen,**  including from birth control pills. There is some information that birth control pills can also decrease estrogen related cancers. This can be understood because we know that if women have children and nurse their babies that the estrogen is released. If they do not have children, then birth control pills can decrease ovulation and be protective. If they do not have children and do not take birth control, more estrogen builds up and estrogen related cancers increase. **Prostate Cancer** is also believed to be promoted by an imbalance of too much dihydrotestosterone, which is a break-down product of the metabolism of Testosterone. Prostate cancer and skin cancer are aggravated by too much iron. Lung cancer is increased by smoking and a deficiency of vitamin A.

**Cervical cancer** is decreased with adequate **folic acid** . Increased Folic Acid prevents the Human Papilloma Virus from taking hold in the uterus.

 Other things that increase fat tissue, estrogen and cancer are **DES** and other chemical growth promoters found as residue in beef fat. **BGH**  residue in dairy, alcohol, excessive fats, birth control and hormone replacement therapy and the chemical nonyl phenol in **plastics** . Food that contains fats like milk, cheese, yogurt and deli meats should not touch plastic. Add waxed paper between the food and the container or put it into glass bottles or jars.

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**Diet and Supplement Solutions**

**Antioxidants**, green, yellow and orange fruits and vegetables help to **prevent** many cancers. Lycopene in tomatoes helps to protect against prostate cancer. See Table 18-10 for other Recommendations for Reducing Cancer Risk (Whitney 606)

**Promotion** Once the growth starts, carotenoids will not protect but will actually promote more growth. **Soy** is helpful is helpful in some ways although has interactions with cancer growth and some treatments. Soy is close in chemical structure to estrogen, so it often enters the estrogen receptor sites in the breast, ovary and uterus. It can be helpful there. It has actually been observed that soy can help to **control**  tumor **growth** because it stops the blood supply to the tumors. If the person consumes a product that contains **soy and sugar**, it brings sugar, a known tumor promoter, to the same sexual sites. \*Soybeans are one thing, but soy based products that contain sugar are inappropriate against cancer and are probably harmful. Soy also increases the need for iodine, which would slow the thyroid gland activity and increase body weight. Whole grain Millet cereal is known to be anti-cancer. Increasing physical activity significantly decreases the risk of breast, colon and prostate cancers. \*It is well known that high intake of added sugar stimulates insulin production which increases cell growth and tumor growth.

**Control**

**\*Cruciferous vegetables**  **help** shrink tumor growth and help the liver control cancer.

**\*Vitamin E Succinate** shrinks tumors by about 25%.

**Essiac tea** , a combination of 4 herbs also helps the liver cleanse out cancer cells.

**Calcium, vitamin D, Magnesium, Fiber**  (morning cereal) decrease the risk of colon cancer. **Vegetables**  that contain **vitamin C** are also helpful against colon cancer. ? \***Vitamin D** during the pregnancy is important for preventing brain tumors in young children. Skin that has enough color from **carotenoids**  and **lycopene** from tomatoes helps prevent skin cancer. Lycopene can help prevent prostate cancer growth.

 **\*Metastasis** can also be helped by **fish oil** to stop the spread. Cruciferous vegetables help the **liver cleanse** the blood of toxins which helps to prevent cancer spreading to other parts of the body. For further information about Nutrition and cancer see:

 Nutrition and Cancer (a Journal)

 American Institute of Cancer Research (AICR) [www.aicr.org](http://www.aicr.org)

 The Cancer Project – clinical research & prevention results: [www.cancerproject.org](http://www.cancerproject.org)

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 **AIDS** (Whitney 528-584)

**AIDS**  - is promoted into a **retrovirus** that destroys the immune system itself. It begins when HIV, **Human Immune Virus,**  is transferred between humans through blood contact and in semen and vaginal fluids. It is a strong virus and about half the people exposed to it can not prevent it from turning into **Aquired Immune Deficiency Syndrome**.

 New testing can now detect it earlier. When the **thymus gland,** part of the immune system, does not screen out the AIDS virus, **T cells** (CD4 cells) decrease in number and no white blood cells are developed.

 Secondarily, **bacterias** like pneumonia and Tuberculosis **multiply & cause infection**. They can be helped with antibacterial herbs. To **prevent**  bacterial infections, AIDS patients should not eat undercooked meat./ Raw vegetables should be cleaned well. Eggs should be washed before handling. **Maitake & Shitake mushroom extracts** and **brown rice** help strengthen the T cells. Preventing destruction of the **inner layer of the colon** by decreasing sugar and alcohol, can help the body screen out the virus and bacterias that come along. Would colostrum help? It is unknown. **Strengthening muscles**  seems to help people fight the virus, probably because muscle **holds on to**  **vitamins and minerals** better than fat tissue. Medicines are protease inhibitors. Too much protease would break down muscle. **Legume beans** have some protease inhibitors Both cancer and AIDS result in a wasting syndrome, an extreme loss of weight. Would **fish oil** help against this? The textbook states that several nutrients can be helpful: Iron, Selenium, protein healthful lipid, folic acid Vitamins A, B6, C, D, E and the mineral zinc. (Whitney 583) Adequate zinc could help fight those secondary bacterial infections.

**Alternative**, **Complementary** or **Integrative Medicine**

Highlight after Chapter 18

**Research Studies** on Food that makes us Healthy is increasingly being researched and new research is published every month in the US and in many other countries. Alternative therapies for **herbal remedies**  and **supplements**  have not been well studied. Information in the textbook Glossary (Whitney 615) defines the names of various **alternative therapies**. There is some information from **folk remedies**, clinical observations in **small studies**  or several doctors’ or nutritionists’ patients. More research needs to be done. With the side effects of many medicines, more people want to try alternative therapies before traditional medicine or afterward if they have not been helped. People need to understand how **herbs** work and if they would interfere with medicines or foods. Some herbs **potentiate medicines**  and some **counteract**  the medicines. Consult a nutritionist or herbalist who has also studied supplements. One can read about the effects of Herbs. Some are described in the textbook in Table H18-1 (Whitney 618) Table H18-2 (Whitney 620) lists Herbs and medicine interactions.

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**Saw Palmetto** is well recognized for prevention of an enlarged prostate gland. Caution: There is some concern that if prostate cancer has developed, saw palmetto could give false positive PSA readings. **St. John’s wort** can help against mild depression, although interferes with human fertilization. **Gymnemma Sylvestre** can help stimulate the pancreas to produce insulin. It should never be tried in children as that would be too dangerous.

Herbs, vitamins and medicines are all more concentrated in children and anyone who is underweight. **Milk Thistle** can help strengthen the liver. **Herbs**, like medicines, often **increase heart rate** and **potentiate** the medicine or **lower the heart rate** and **counteract a medicine.** So you need to know or research how the herb works. Some Chinese and Indian herbs have heavy **metal residues** when they use chemicals in growing or processing that are not allowed in the United States. Taken in small amounts herbs can be helpful, al)though we still must eat a balanced diet.

 \*People sometimes lie or **exaggerate**  over the **internet** and on television. People are licensed and **certified for one state,** unless that is **transferred**  or added to another state. But not usually in all states. Caution: **Multi-level marketers** are sometimes more interested in selling you something than in your health.

Some medical schools are giving elective courses on alternative therapies, but not about nutrition. Some therapies have **animal glandulars.** They should only be taken for short periods of time to generate human glands to work better. Then the glandular supplements should be stopped. Other wise they overstimulate the human glands.

Acupuncture is now common. It helps to reduce pain and may prevent other problems. It is being used to help control addictions, including against smoking.

Some wholistic therapies are not accepted by traditional medicine or the US government. There are therapies that have some success that are not allowed to be provided in the US. The actual treatment is in Mexico. Another alternative therapy that is interesting is the belief in **mental affirmation,(**Hay 1984)repeating a thought process, to change the body’s response or reaction to a pattern of behavior. Other people try meditation or visualization to try to change the body’s response to illness. (Hay 1987)

**Other Illnesses**

**Herpes** Cold Sores are symptoms of the amino acid **Lysine** deficiency. Meats and milk provide that amino acid. Melissa Cream softens the sore

 Tea Tree Oil hardens the sore

 Echinacea and Glycyrrhizin fight the mild fever or virus

Fungal infections - grapefruit seed extract, pau d’arco and tea tree essential oil are

 helpful against them

 Diet: decrease sugar, yeast and dry cheeses and fermented drinks

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Bacteria - goldenseal, Vitamin C, cranberry are helpful against them

Anti-viral - Echinacea, Elderberry, Glycyrrhizin from the root of licorice plants

Mosquito bites - baking soda and witch hazel or aloe vera gel

Falls in the elderly - adequate Calcium, Magnesium, Vitamin D, Vitamin B1 and 12

Decrease in height - all of the above plus adequate cartilage between the bones of the

 spine and joints. Glucosamine/ Chondroitin skin cream could help.

\*See Handouts:

Nutrition in the Hospital

Nutrition and Dental Health

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\*Note: Test 2 at Class 12 covers Classes 9, 10, 11 and Textbook Chapters 14 -18