Osteoporosis

Osteoporosis is a metabolic bone disorder in which the rate of bone reabsorption accelerates and the rate of bone formation decelerates, resulting in a decrease in bone mass. The bones affected by osteoporosis lose calcium and phosphate and become brittle and abnormally prone to fractures (Marieb, 2010). Osteoporosis can be a primary disorder, occurring alone, or it can occurr secondary to another disease process. The cause of primary osteoporosis is unknown, but some of the factors that are believed to contribute to the cause of the disease are a mild prolonged lack of calcium related to poor dietary intake, hormonal imbalance related to endocrine deficiency, poor metabolism of protein related to low estrogen, and a sedentary life style (Marieb, 2010). The cause of secondary osteoporosis is often the result of another disease such as alcoholism, malnutrition, liver disease, scurvy, lactose intolerance, hyperthyroidism, and rheumatoid arthritis (Marieb, 2010).

There are many risk factors that are associated with developing osteoporosis. The major risk factors include being female, being over the age of 60 for females and over 75 for males, postmenopausal estrogen deficiency, a family history of osteoporosis, a thin, lean body build, a history of smoking and high alcohol intake, and a lack of physical activity or prolonged immobility (Marieb, 2010). Osteoporosis is diagnosed based on a combinations of the symptoms the person is experiencing along with diagnostic procedures. The symptoms that are often experienced by someone with osteoporosis include reduced height, sudden pain after lifting and bending that is made worse with activity and better with rest, restriction with movement and a history of fractures (Lippincott, 2006). Some of the other symptoms associated with osteoporosis

are kyphosis, or “hunch back”, which is caused by micro fractures that cause a curvature of the upper spine and pain when the affected area is touched, or palpated (Lippincott, 2006).

The laboratory tests that are commonly used to reach a diagnosis of osteoporosis are serum calcium, vitamin D, phosphorus and alkaline phosphatase levels. These blood tests are done to monitor the levels and are used to rule out other disorders that can have similar symptoms such as Paget’s disease and osteomalacia (Lippincott, 2006). The common diagnostic procedures done to diagnose osteoporosis include radiographs, dual energy x-ray absorptiometry (DEXA), and quantitative ultrasound (QUS). Radiographs are done of the spine and the long bones, such as the femur, to reveal low bone density and to see if there are any fractures. Dual energy x-ray absorptiometry (DEXA) is used to screen for early changes in bone density. It is a painless test that measures bone density in the wrist, hip and spine. Quantitative ultrasound (QUS) is an ultrasound that is usually done of the heel, and is used to assess for the risk of fracture. This is done by looking at the bones in the heel that are very important in weight bearing, and assessing if there are any fractures. QUS is commonly used because it is inexpensive, portable, and a low-risk method to determine osteoporosis (Lippincott, 2006).

While there is no cure for osteoporosis, there are several medications that can be used to help slow the process of the disease. One of the classifications of medication that can be used to help prevent secondary osteoporosis related to estrogen deficiency is estrogen hormone supplement. Hormone supplements replace the estrogen lost because of menopause (Davis, 2011). Another medication that is used is Evista, it is a selective estrogen receptor modulator that decreases osteoclast activity which decreases bone reabsorption (Davis, 2011). Fosamax, Boniva, and Actonel are part of a class of drugs called Bisphosphonates. These drugs work to decrease the number and action of osteoclasts which inhibits the bone reabsorption (Davis,

2011). Calcium supplements, such as Os-Cal and Citrical, are used in the prevention as well as the treatment. They are used to supplement the dietary intake of calcium from food products (Davis, 2011). Vitamin D supplements are used along with Calcium supplements, the increase the absorption of calcium in the intestinal tract. Vitamin D is needed by individuals who are not exposed to enough sunlight or do not meet the daily requirements (Davis, 2011).

If left untreated osteoporosis can cause major damage on the skeletal system. Because of a loss of bone density the bones become brittle and can fracture easily. This can become a major issue in the population that osteoporosis affects, post-menopausal women over 60. Because of the advanced age of the individuals affected by osteoporosis, they also have issues with increased risk of falls related to things such as gait changes, impaired balance, vision and hearing loss and generalized weakness (. This puts the individual at a much higher risk for fractures of bones such as the hip and femur if they were to fall. Another change that osteoporosis has on the skeletal system is the development of kyphosis, commonly referred to as hump back (dowager's hump). This is usually reported as a slow loss of height and a curvature of the spine that worsens over time because of the repeated vertebral fractures that are occurring (Lippincott, 2006). As kyphosis worsens, it can cause the abdomen to protrude to compensate for the change in the center of gravity. Also individuals often report exercise intolerance and trouble breathing, and they also may experience muscle spasm and decreased spinal movement and discomfort (Lippincott, 2006).

Although osteoporosis cannot be cured, there are many ways that individuals affected can manage the disease and lead normal lives. Individuals with osteoporosis work together with their primary care doctors to develop a program to help maintain bone integrity and hopefully increase bone density. These programs often include physical therapy or a gentle exercise

program along with drug therapy, these care programs aim at controlling bone loss, preventing fractures, and controlling pain. If fractures do occur surgery may be necessary to correct the fracture, along with the used of supportive devices, such as back braces (Lippincott, 2006). Along with exercises programs individuals should eat a balanced diet that is rich in nutrients high in vitamin D, calcium, and protein to support a healthy skeletal metabolism (Lippincott, 2006).

Works Cited

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Work Sample Evaluation

Subject Area: Human Anatomy and Physiology
Task Title: A Bone to Pick
Student Work Sample Title: Osteoporosis

The document was scored using the *CCR Task Bank Rubric*. The final scores are indicated in the following chart.

Scoring Criteria	Insufficient Evidence	Developing	Progressing	Accomplished	Exceeds
Research and Investigation				**X**	
Ideas and Content			**X**		
Reading and Analysis			**X**		
Communication				**X**	
Organization				**X**	
Accuracy				**X**	

Annotations: The following evidence from the work sample and the reviewer's comments support the scores above. Page and line numbers refer to the original work sample.

Scoring Criteria	Page #	Line #	Commentary about the work sample
Research and Investigation: *Locating resources independently and/or identifying information within provided texts*	5	2-7	There are three different sources used in the work sample; all the sources were textbooks.
			The use of scientific journals would have been more appropriate for this type of report.
Ideas and Content: *Presenting a thesis and understanding concepts*	1	4-7	While the student forms a thesis statement, its scope is minimal and does not include all aspects of the paper.
	2-3	16-5	The student provides a very good description linking treatments to bone structure and its function.
Reading and Analysis: *Evaluating sources and selecting evidence to support the central idea*	2	20-23	The student does a good job of interpreting how drugs work to slow down the rate of osteoporosis.
Communication: *Using subject-appropriate language and considering audience*			The terminology used throughout the paper is appropriate for a medical student.
Organization: *Structuring main ideas and supporting information*	All		The paper contains good transitions that make it flow well.
	All		All thoughts and discussions progress in a logical manner; the description and causes of osteoporosis are followed by risk factors, diagnosis, and laboratory tests to confirm diagnosis. Finally, the work sample covers treatment options, the damage done to the skeletal system and other body systems without treatment, and the overall management of the disease.
Accuracy: *Attending to detail, grammar, spelling, conventions, citations, and formatting*	1	8	One misspelled word found, "occurr" rather than occur.
	3	11	One misplaced punctuation was discovered, the student used a "(" where there should not have been one.
	5	2-7	The Works Cited page has some inconsistencies (see the missing date in the second citation).