CHART 39–1 NANDA, NIC, AND NOC LINKAGES

The Client with Osteoporosis

<table>
<thead>
<tr>
<th>NURSING DIAGNOSES</th>
<th>NURSING INTERVENTIONS</th>
<th>NURSING OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Pain</td>
<td>Medication Administration</td>
<td>Comfort Level</td>
</tr>
<tr>
<td>Risk for Trauma</td>
<td>Pain Management</td>
<td>Pain: Disruptive Effects</td>
</tr>
<tr>
<td>Knowledge Deficit: Calcium Intake</td>
<td>Environmental Management: Safety</td>
<td>Risk Control</td>
</tr>
<tr>
<td></td>
<td>Fall Prevention</td>
<td>Safety Behavior: Fall Prevention</td>
</tr>
<tr>
<td></td>
<td>Health Education</td>
<td>Self-Care: Activities of Daily Living</td>
</tr>
<tr>
<td></td>
<td>Teaching: Disease Process</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teaching: Disease Process</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teaching: Prescribed Diet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teaching: Prescribed Medications</td>
<td></td>
</tr>
</tbody>
</table>


Nancy Bauer is a 53-year-old schoolteacher. She has been married for 36 years and has two children. Mrs. Bauer says she is 65 inches tall. She has smoked one pack of cigarettes a day for 30 years and drinks one to two glasses of wine with dinner each evening. She does not routinely exercise. Mrs. Bauer has had symptoms of menopause for 8 years, including hot flashes in the early years and mood swings of late. She has never been on hormone replacement therapy.

Mrs. Bauer is currently seeking medical advice for continuous low back pain. The pain is not relieved with an over-the-counter analgesic, and she frequently wakes up during the night because of the pain.

ASSESSMENT

The nurse practitioner notes that Mrs. Bauer’s vital signs are all within normal limits. She has full range of motion of all extremities and is able to stand and bend over, but she reports discomfort when returning to the upright position. Mrs. Bauer has a slightly pronounced “hump” on her upper back and is 1 inch shorter than her stated height on admission. Her muscle strength is symmetric and strong.

DIAGNOSIS

- Acute pain of the lower spine, related to vertebral compression
- Deficient knowledge, related to osteoporosis and treatment to prevent further damage
- Imbalanced nutrition: Less than body requirements, related to inadequate intake of calcium
- Risk for injury, related to effects of change in bone structure secondary to osteoporosis

EXPECTED OUTCOMES

- Verbalize how stopping smoking can help prevent further progression of osteoporosis.
- Seek consultation for supplements and medications to prevent further bone loss.
- Design a program of physical activity to prevent complications of osteoporosis.
- Verbalize safety precautions to prevent fractures due to falls.

PLANNING AND IMPLEMENTATION

- Teach back strengthening exercises.
- Refer to an osteoporosis support group, if available.
- Provide realistic, yet optimistic, feedback about loss of height and bone integrity and the potential outcomes of treatment.
- Assess current knowledge base, and correct misconceptions regarding treatment of osteoporosis.
- Provide current educational literature regarding treatment of osteoporosis.
- Instruct in dietary and calcium supplements that help prevent effects of osteoporosis.
- Discuss physical exercises that help prevent complications due to osteoporosis.
- Review safety and fall precautions, and provide literature regarding how to create a safe home environment.

EVALUATION

On her return visit 6 months later, Mrs. Bauer reports that she feels much better. She is no longer irritable and does not experience mood swings, because she has been taking her prescribed hormone replacements for 6 months. She is eating products rich in calcium and taking a daily supplement of calcium with vitamin D. Mrs. Bauer has reduced her wine intake to one glass in the evening and now drinks decaffeinated coffee and tea. She also states that since she stopped smoking, she has been walking 30 to 45 minutes every day.

(continued)
Paget’s disease, also called osteitis deformans, is a progressive skeletal disorder that results from excessive metabolic activity in bone, with abnormal bone resorption and formation. This chronic remodeling results in the affected bones being larger and softer (McCance & Huether, 2002). This disorder affects the axial skeleton, especially the femur, pelvis, vertebrae, sacrum, sternum, and skull. Paget’s disease affects about 3% of the population over age 40, and the incidence doubles each 10 years after age 50. Paget’s disease occurs more frequently in whites in continental Europe, England, Australia, New Zealand, and North America. It has a familial tendency and is slightly more common in men than in women (Porth, 2002).

**PATHOPHYSIOLOGY**

The cause of Paget’s disease is unknown; however, several theories have been proposed, including hormonal imbalance, vascular disorder, neoplasm, autoimmune disorder, and inborn error of connective tissue. Of people affected by Paget’s disease, 20% to 30% have a family history of the disorder, suggesting a genetic linkage. A slow-activating viral infection also has been theorized as a cause of Paget’s disease.

Paget’s disease progresses slowly. It usually follows a two-stage process: an excessive amount of osteoclastic bone resorption, followed by excessive osteoblastic bone formation. The initial phase presents with an abnormal increase in osteoclasts. The bones increase in size and thickness because of the acceleration in bone resorption and regeneration, resulting in a thick layer of coarse bone with a rough and pitted outer surface (Porth, 2002). Resorption of cancellous bone occurs rapidly. As new bone tissue tries to replace the loss, fibrous tissue forms in the bone marrow. The bone is at first hyperemic and soft, and bowing occurs. When this excessive bone cell activity decreases, the result is a gain in bone mass, but the newly formed bone becomes hard and brittle. This brittleness may lead to fractures. Paget’s disease varies in severity, and may involve one or many bones.

**Manifestations and Complications**

Most clients with Paget’s disease are asymptomatic, and the disease often is discovered when typical changes are seen on an incidental X-ray. Manifestations are often vague and depend on the specific area involved (see the box below). The most common complaint is localized pain of the long bones, spine, pelvis, and cranium. The pain is described as a mild to moderate deep ache that is aggravated by pressure and weight bearing. It is more noticeable at night or when the client is resting. The pain usually is due to metabolic bone activity, secondary degenerative osteoarthritis, fractures, or nerve impingement. Because of the increase in blood flow to pagetic bone, flushing and warmth of the overlying skin may be apparent.

Other complications of Paget’s disease are as follows:
- Nerve palsy syndromes from involvement of the upper extremities
- Pathologic fractures from loss of bone structure
- Mental deterioration from compression of the brain when the skull is involved
- Compression of the spinal cord from affected cervical vertebra causing tetraplegia
- Cardiovascular disease, resulting from vasodilation of the vessels in the skin and subcutaneous tissues overlying the affected bones
- Osteogenic sarcoma (in about 1% of cases)