Nursing Process Focus:
Patients Receiving Cyclophosphamide (Cytoxan)

Assessment
Prior to administration:
- Obtain complete health history including allergies, drug history and possible drug interactions
- Assess for presence/history of specific type of cancer, bone marrow suppression, tumor cell infiltraton of bone marrow, recent chemotherapy or radiation.
- Obtain kidney, and liver function tests
- Assess platelet count
- Assess for symptoms of compromised immune system

Potential Nursing Diagnoses
- Body image, disturbed, risk for, related to possible alopecia and other side effects of medication which cause changes in appearance
- Fluid volume, deficient, risk for, related to nausea, vomiting, diarrhea
- Infection, risk for, related to compromised immune system
- Knowledge, deficient, related to no previous experience with medication
- Noncompliance, related to unacceptance of diagnosis, unpleasant side effects of medication
- Nutrition, imbalanced, less than body requirements, related to nausea, vomiting, diarrhea, anorexia
- Tissue integrity, Risk for impaired, related to extravasation of IV cyclophosphamide

Planning: Patient Goals and Expected Outcomes
Patient will:
- Demonstrate absence of serious adverse effects
- Exhibit acceptance of expected side effects
- Demonstrate compliance with recommended therapeutic regimen
- Demonstrate knowledge of mechanism of action of cyclophosphamide
- Demonstrate understanding of which side effects to report immediately

Implementation

<table>
<thead>
<tr>
<th>Interventions and (Rationales)</th>
<th>Patient Education/Discharge Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate baseline data, including general health status, vital signs, weight, lab results, specific type of cancer.</td>
<td>Advise patient of importance of complete work-up prior to beginning chemotherapy.</td>
</tr>
<tr>
<td>Monitor for anemia and leukopenia, two most common indicators of myelosuppression. (If present, patient will be unable to protect self against even smallest infection.)</td>
<td>Instruct patient to: Notice and report fever of unknown origin, chills, sore throat, bruising, unusual bleeding Avoid others with infections</td>
</tr>
<tr>
<td>Monitor for cardiac problems. (Myopericarditis may occur and is a sign of a serious adverse reaction to medication.)</td>
<td>Instruct patient to report immediately tachycardia, dyspnea, fever, or chills.</td>
</tr>
<tr>
<td>Monitor for respiratory problems. (Patient may experience cough and dyspnea; medication can cause fibrosis in lungs,</td>
<td>Instruct patient to: Be aware of any new respiratory problems</td>
</tr>
<tr>
<td>which would decrease functional capacity of lungs.)</td>
<td>Report cough with or without sputum production, dyspnea, inability to do previous activities because of fatigue</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>• Observe for hematuria. (Hemorrhagic cystitis may result from cyclophosphamide use secondary to continuous irritation of bladder from medication.)</td>
<td>Instruct patient to:</td>
</tr>
<tr>
<td></td>
<td>• Consume 3000cc fluids/day (3 quarts/day) on day before treatment and for 72 hours after, if not contraindicated by another condition</td>
</tr>
<tr>
<td></td>
<td>• Be aware of color changes in urine and report immediately</td>
</tr>
<tr>
<td></td>
<td>• Have routine urinalysis performed</td>
</tr>
<tr>
<td></td>
<td>• Not take cyclophosphamide at bedtime because voiding during night is too infrequent to prevent cystitis</td>
</tr>
<tr>
<td></td>
<td>• Report any signs of a UTI because cystitis can occur up to several months after cyclophosphamide use is discontinued</td>
</tr>
<tr>
<td>• Monitor for side effects/adverse reactions.</td>
<td>• Instruct patient to report nausea, vomiting, anorexia, diarrhea, abdominal pain, headache, swollen lips, rash, darkening of skin and nails, missed menstruation.</td>
</tr>
<tr>
<td>• Observe for alopecia. (All chemotherapeutic agents attack normal, fast-growing cells as well as cancer cells; hair cells are very fast growing, so hair growth stops and hair will fall out.)</td>
<td>• Reassure patient that hair growth will reoccur after completion of cyclophosphamide therapy, but hair may be a different color and/or texture</td>
</tr>
<tr>
<td>• Provide emotional support to patient and family.</td>
<td></td>
</tr>
<tr>
<td>• Refer patient to ACS or other legitimate support groups and to get a wig before hair loss requires it, to ease transition</td>
<td></td>
</tr>
</tbody>
</table>
- Monitor for herpes zoster or chickenpox. (If patient recently had either herpes zoster or chickenpox, has now, or has been exposed to chickenpox, he/she cannot take cyclophosphamide; it may cause exacerbation or increased severity of herpes or chickenpox. Patient is immunosuppressed because of medication, so his/her body cannot fight against a live virus introduced to it.)

- Instruct patient that he/she or members of household should not be vaccinated against chickenpox during therapy.

- Monitor for decreased hepatic functioning. (Cyclophosphamide is metabolized in liver Decreased hepatic functioning could lead to toxicity, since liver may not be able to metabolize drug, therefore there will be increased levels in body.)

- Instruct patient to be aware of yellowing of skin or whites of eyes, color changes in stool from brown to clay-colored, and to report immediately.

- Monitor for decreased kidney functioning. (Cyclophosphamide is excreted through kidneys.)

- Instruct patient to note and report any changes in urinary function: decreased urination, changes in color or odor of urine, generalized edema.

- Evaluate for overdose. Symptoms include: nausea, vomiting, anorexia, alopecia, myelosuppression.

- Instruct patient to notify health care provider if symptoms appear, and that treatment will be supportive (control of nausea or vomiting, etc.).

- Monitor for diabetes mellitus. (Patient may lose glycemic control; symptoms of hypoglycemia may appear secondary to combination of cyclophosphamide and insulin.)

- Advise patient to monitor blood sugar daily and report to health care provider if trends become apparent (either hypo- or hyperglycemia). Hypoglycemic medication doses may need to be adjusted during therapy.

**Evaluation of Outcome Criteria**
Evaluate the effectiveness of drug therapy by confirming that patient goals and expected outcomes have been met (see “Planning”).

---

<table>
<thead>
<tr>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor for herpes zoster or chickenpox. (If patient recently had either herpes zoster or chickenpox, has now, or has been exposed to chickenpox, he/she cannot take cyclophosphamide; it may cause exacerbation or increased severity of herpes or chickenpox. Patient is immunosuppressed because of medication, so his/her body cannot fight against a live virus introduced to it.)</td>
</tr>
<tr>
<td>Instruct patient that he/she or members of household should not be vaccinated against chickenpox during therapy.</td>
</tr>
<tr>
<td>Monitor for decreased hepatic functioning. (Cyclophosphamide is metabolized in liver Decreased hepatic functioning could lead to toxicity, since liver may not be able to metabolize drug, therefore there will be increased levels in body.)</td>
</tr>
<tr>
<td>Instruct patient to be aware of yellowing of skin or whites of eyes, color changes in stool from brown to clay-colored, and to report immediately.</td>
</tr>
<tr>
<td>Monitor for decreased kidney functioning. (Cyclophosphamide is excreted through kidneys.)</td>
</tr>
<tr>
<td>Instruct patient to note and report any changes in urinary function: decreased urination, changes in color or odor of urine, generalized edema.</td>
</tr>
<tr>
<td>Evaluate for overdose. Symptoms include: nausea, vomiting, anorexia, alopecia, myelosuppression.</td>
</tr>
<tr>
<td>Instruct patient to notify health care provider if symptoms appear, and that treatment will be supportive (control of nausea or vomiting, etc.).</td>
</tr>
<tr>
<td>Monitor for diabetes mellitus. (Patient may lose glycemic control; symptoms of hypoglycemia may appear secondary to combination of cyclophosphamide and insulin.)</td>
</tr>
<tr>
<td>Advise patient to monitor blood sugar daily and report to health care provider if trends become apparent (either hypo- or hyperglycemia). Hypoglycemic medication doses may need to be adjusted during therapy.</td>
</tr>
</tbody>
</table>
**Nursing Process Focus:**

**Patients Receiving METHOTREXATE (MTX, Folex PFS)**

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Potential nursing diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prior to administration:</strong>&lt;br&gt;• Obtain complete health history including allergies, drug history and all medications for possible drug interactions&lt;br&gt;• Assess kidney, liver function, CBC, and platelet count&lt;br&gt;• Assess for presence/history of specific type of cancer, decreased hepatic or renal function, bone marrow depression, herpes zoster, chicken pox.</td>
<td>• Body image, disturbed, related to side effects of medication&lt;br&gt;• Fluid volume, deficient, risk for related to nausea/vomiting, anorexia, secondary to methotrexate&lt;br&gt;• Knowledge, deficient, related to no prior experience with this medication&lt;br&gt;• Protection, ineffective, related to immunosuppressive effects of methotrexate&lt;br&gt;• Therapeutic regimen management, ineffective, related to inability to cope with side effects, diagnosis, prognosis</td>
</tr>
</tbody>
</table>

**Planning: Patient Goals and Expected Outcomes**

Patient will report:<br>• Acceptance of need for therapy with methotrexate<br>• Ability to cope with expected side effects<br>• Absence of serious side effects/adverse reactions<br>• Presence of any of above

Patient and family will express understanding of:<br>• Mechanisms of action of methotrexate<br>• Common, expected side effects and methods to decrease severity

**Implementation**

<table>
<thead>
<tr>
<th>Interventions and (Rationales)</th>
<th>Patient Education/Discharge Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>• If patient is to receive high dose methotrexate with leukovorin rescue, baseline urine pH must be done. (Patient’s pH must be maintained at 7 or &gt; (alkaline urine) in order for methotrexate to be adequately eliminated through kidneys and to decrease chance of kidney damage.)</td>
<td>• Advise patient of the importance of complete physical exam with lab studies prior to beginning methotrexate therapy and to have periodic lab studies performed during therapy with methotrexate&lt;br&gt;• Inform patient about ways to keep urine pH at 7 or above: drink cranberry juice daily, increase fluid consumption, avoid highly acidic fluids such as orange or grapefruit juice</td>
</tr>
<tr>
<td>• Monitor immune status. (Methotrexate should not be given if patient is immunodeficient; medication would further deplete WBC reserves, and increase patient’s risk of developing infections which could be life-threatening.)</td>
<td>• Advise patient to avoid persons with URIs and other infectious conditions while receiving methotrexate.</td>
</tr>
<tr>
<td>• Monitor for GI side effects, including</td>
<td>Teach patient:</td>
</tr>
<tr>
<td>Side Effect</td>
<td>Steps to Decrease Side Effects, Early Recognition of Problems</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Nausea/vomiting, ulcers, GI bleeding, stomatitis. (Chemotherapeutic agents attack fastest growing cells, which include cells in GI tract, which are destroyed, causing these side effects.)</td>
<td>Administer anti-emetic as needed</td>
</tr>
<tr>
<td>• Observe for alopecia. (Hair loss can be upsetting to patient, especially female patient.)</td>
<td>Inform patient about local support groups such as ACS</td>
</tr>
<tr>
<td>• Refer to support group.</td>
<td>Reassure patient that hair regrowth will occur after methotrexate therapy completed, but hair may be different color or texture.</td>
</tr>
<tr>
<td>• Monitor for integumentary side effects such as rash, pruritis, acne, boils. (These may occur secondary to fact that highest doses of methotrexate are found in skin (as well as in kidneys, liver, spleen and gallbladder), and may cause severe skin irritation.)</td>
<td>Instruct patient to:</td>
</tr>
<tr>
<td>• Monitor platelet count. (If platelet count decreased, avoid invasive procedures or use extreme caution; hemorrhage could occur secondary to patient lacking adequate platelets for blood coagulation/clotting)</td>
<td>Teach patient to:</td>
</tr>
<tr>
<td>• Test urine, stool, emesis for occult blood</td>
<td>• Be aware of any rash, pruritis, acne, boils</td>
</tr>
<tr>
<td>• Evaluate fluid intake. (A higher fluid intake will lead to increased urine production, which will decrease chance of kidney damage occurring as result of methotrexate.)</td>
<td>• Use unscented lotion on rash or pruritic areas</td>
</tr>
<tr>
<td>• Monitor for gout or history of urate kidney stones. (Patient has increased chance of worsening hyperuricemia, because kidneys are one of areas in body which has highest distribution of methotrexate, as well as where drug is excreted, therefore it can be “laid down” there, causing irritation or stone formation.)</td>
<td>• Report any new acne or boil formation</td>
</tr>
<tr>
<td>• Obtain history of herpes zoster or chickenpox, actual or exposure to. (Patient has risk of more severe, generalized</td>
<td>Advise patient/family to:</td>
</tr>
<tr>
<td></td>
<td>• Avoid exposure to chickenpox or herpes zoster</td>
</tr>
<tr>
<td>disease occurring.)</td>
<td>• Avoid vaccinations during time patient receiving methotrexate</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
</tbody>
</table>

**Evaluation of Outcome Criteria**
Evaluate the effectiveness of drug therapy by confirming that patient goals and expected outcomes have been met (see “Planning”).
### Nursing Process Focus:
**Patients Receiving DOXORUBICIN (Adriamycin)**

#### Assessment
Prior to administration:
- Obtain complete health history including allergies, drug history and possible drug interactions
- Assess for presence(history of:  
  - Specific neoplasia present  
  - Decreased hepatic functioning  
  - Decreased bone marrow or infiltration of marrow by tumor cells  
  - Gout or urate kidney stones  
  - Radiation therapy  
  - Cardiac problems  
  - Side effects/adverse reactions  
  - Overdose  
  - Age of patient  
  - Herpes zoster or chickenpox, disease or recent exposure  
  - Other medications patient is taking  
  - Pregnancy/lactation

#### Potential Nursing Diagnoses
- Body image, disturbed, related to physical changes secondary to doxorubicin
- Fluid volume, deficient, risk for, related to diarrhea, nausea/vomiting secondary to medication
- Knowledge, deficient, related to no previous contact with cancer or its treatments
- Nutrition, less than body requirements, related to anorexia, nausea/vomiting, diarrhea secondary to medication
- Oral mucous membranes, impaired, related to stomatitis secondary to medication
- Skin integrity, impaired, risk for, related to extravasation, cellulitis

#### Planning: Patient Goals and Expected Outcomes
Patient will:
- Demonstrate symptoms of clinical improvement
- Experience absence of adverse reactions
- Demonstrate understanding of mechanism of action of doxorubicin
- Demonstrate understanding of expected side effects, and measures to decrease their severity
- Adverse reactions to report

#### Implementation

<table>
<thead>
<tr>
<th>Interventions and (Rationales)</th>
<th>Patient Education/Discharge Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Obtain baseline information including vital signs, EKG and other cardiac work-ups, CBC and other blood studies.</td>
<td>• Advise patient of importance of complete physical exam prior to and periodically during treatment with doxorubicin.</td>
</tr>
</tbody>
</table>
| • Monitor for stomatitis or ulcerations. (They are common side effects of doxorubicin, secondary to destruction of fastest growing cells by chemotherapeutic agents.) If necessary, a special mouth rinse may be ordered. | Advise patient to:  
  - Examine mouth daily for signs of breakdown of mucous membranes  
  - Use only soft bristle toothbrush, avoid hard or spicy foods likely to cause irritation, avoid toothpicks |
- Monitor hepatic functioning. (Doxorubicin is metabolized in liver, so decreased liver function can lead to doxorubicin toxicity.)  
  - Instruct patient to keep appointments for lab work.

- Monitor intake and output. (Increased fluids will increase urine production and increase elimination of uric acid, leading to decreased chance of urate kidney stone formation.)  
  - Advise patient:  
    - To drink 2-3 quarts fluids/day, unless contraindicated by another condition  
    - About other substances that can be substituted for part of fluids: gelatin, popsicles, ice cream, etc.

- Observe color of urine. (Doxorubicin will turn urine red-brown in color for 1-2 days after administration.)  
  - Advise patient to be aware of color changes in urine, and that it is not hematuria but is an effect of the medication itself.

- Monitor for nausea or vomiting. Patient should have prescription for anti-emetic for use at home if needed.  
  - Teach patient/family:  
    - Proper use of anti-emetic at home  
    - To take anti-emetic at first sign of nausea, not to wait until vomiting commences  
    - Concerning other measures to decrease nausea/vomiting (small meals, cold rather than room temperature liquids, pleasant dining surroundings, remove unnecessary items from dining area, avoid strong odors, etc.)

- Observe for skin changes. (Doxorubicin may cause soles of feet, palms of hands, nail beds to darken. Cellulitis may occur at IV site secondary to irritation from medication; if present, change IV site, apply warm cloths, elevate extremity if possible.)  
  - Advise patient:  
    - that doxorubicin may cause soles of feet, palms of hands, nail beds to darken and to not be alarmed if this happens  
    - To note and report immediately any redness, heat, swelling at IV site

- Ensure that EKG is obtained (Toxicity may show up as T-wave flattening, sinus tachycardia, ST depression, voltage reduction on EKG secondary to cardiac depression. CHF may not appear for up to 6 months after completion of doxorubicin therapy. Cardiotoxicity is more common in patients over age 70 and under age 2, because their cardiac systems are more susceptible to certain medications, including doxorubicin.)  
  - Instruct patient to  
    - Have periodic EKG done and if EKG changes are present, medication will be discontinued because they are a sign of drug toxicity  
    - Report signs of CHF (pedal edema, neck vein distention, fatigue, dyspnea, etc.)  
    - Signs of CHF may not appear immediately
- Monitor WBC. (WBC usually lowest 10-14 days after dose of doxorubicin, and returns to patient’s normal within 21 days.)

- Advise patient:
  - That susceptibility to infections is greatest when WBC is decreased
  - To avoid persons with URIs, other infectious diseases
  - To report fever, chills, sore throat, etc.

- Obtain history of radiation therapy, current or in past. (Doxorubicin cannot be used if patient experienced marked myelosuppression from radiation therapy; he/she would suffer further myelosuppression.)

- Advise patient of importance of complete disclosure of past medical history and treatments.

- Monitor for flu-like symptoms. (May be symptom of impending toxicity.). Report immediately

- Instruct patient about which symptoms to report immediately: nausea, vomiting, diarrhea, anorexia.

- Monitor for alopecia. (Alopecia commonly occurs with doxorubicin therapy, secondary to fact that chemotherapeutic agents attack fastest growing cells in body (including hair cells), and destroy them, causing hair loss.)

- Provide emotional support.

- Advise patient that hair loss is temporary, and hair re-growth will occur after completion of doxorubicin therapy, but hair may be different texture or color.

- Advise patient about local support groups such as ACS

- Encourage patient to get wig and start wearing before hair loss is severe

- Monitor for side effects/adverse reactions patient may experience, including facial swelling, flushing, headache, chills, back pain, tightness in chest and throat, hypotension, desquamation of skin on hands and feet, conjunctivitis in addition to those side effects already listed above. Report to health care provider.

- Instruct patient/family to report facial swelling, flushing, headache, chills, back pain, tightness in chest and throat, dizziness, weakness, desquamation of skin on hands and feet, conjunctivitis.

- Monitor for symptoms of overdose. Symptoms include nausea/vomiting, myelosuppression, irreversible cardiac toxicity, or mucositis. Report immediately.

- Instruct patient to report any changes in how he/she feels immediately and that treatment will depend on which symptoms appear, and will most likely be done on in-patient basis

<table>
<thead>
<tr>
<th>Evaluation of Outcome Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate the effectiveness of drug therapy by confirming that patient goals and expected outcomes have been met (see “Planning”).</td>
</tr>
</tbody>
</table>
**Nursing Process Focus:**
**Patients Receiving VINCRISTINE (Oncovin)**

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Potential Nursing Diagnoses</th>
</tr>
</thead>
</table>
| Prior to administration:  
• Obtain complete health history including allergies, drug history and possible drug interactions.  
• Assess for presence/history of specific cancer, bone marrow depression, radiation treatent, herpes zoster or chicken pox, infection |  
• Body image, disturbed, related to alopecia and other side effects  
• Fluid volume, deficient, risk for, related to diarrhea, vomiting secondary to side effects of vincristine  
• Nutrition, imbalanced, less than body requirements, related to loss of appetite secondary to vincristine  
• Protection, ineffective, related to decreased WBC secondary to medication  
• Tissue integrity, impaired, related to extravasation at IV site with resultant cellulites |

**Planning: Patient Goals and Expected Outcomes**

Patient will:

• Experience minimal adverse reactions to vincristine  
• Demonstrate knowledge of mechanisms of action of vincristine  
• Demonstrate knowledge of measures to decrease severity of side effects and increase comfort

**Implementation**

<table>
<thead>
<tr>
<th>Interventions and (Rationales)</th>
<th>Patient Teaching/Discharge Planning</th>
</tr>
</thead>
</table>
| Monitor for decreased hepatic functioning. (Vincristine is metabolized in liver) | Instruct patient to:  
• Get regular liver function tests performed  
• Report any signs of decreased liver function: yellowing of skin or whites of eyes, clay-colored stools |
| Monitor for infection. (Bone marrow suppression may occur, with resultant immunosuppression.) | Teach patient and caregiver methods to decrease exposure to infections: stay away from persons with URIs, decrease exposure to children, get adequate sleep, try to eat well-balanced diet and to report any fever, increased fatigue, sore throat, etc. immediately |
| Monitor for symptoms of neurologic or neuromuscular side effects. (The most serious limiting adverse effects of vincristine relate to nervous system toxicity.) | Advise patient and caregiver to monitor for sensory impairment (decreased sensations, vision or hearing), numbness or tingling of fingers or toes, ataxia and to report immediately |
| Monitor kidney function. (Vincristine may cause SIADH, evident by | Advise patient to:  
• Increase fluid intake to 2-3quarts/day |

---

---
| Monitor baseline labs and periodic lab results during vincristine therapy, including hematocrit, hemoglobin, platelets, WBC. (Decreased blood counts put patient at higher risk for infection or fatigue.) | Teach patient:  
- The importance of lab studies prior to and periodically during vincristine therapy  
- About energy conservation methods, such as frequent rest periods, planning activities during times of highest energy levels, allowing others to assist with chores, etc. |
| Monitor bowel function. (Constipation is an early sign of toxicity. Administering water, laxative, stool softener before dose of vincristine may help decrease constipation. If fecal impaction occurs, patient may need enemas.) | Advise patient:  
- To report new episode of constipation immediately  
- Measures to decrease or eliminate constipation, including increasing fluids, fiber, etc. and to exercise if condition allows  
- To report constipation or abdominal pain before taking laxative |
| Monitor for signs of alopecia. (Chemotherapeutic agents attack fastest growing cells in body, including hair cells.) | Advise patient:  
- That alopecia is temporary, and that hair will grow back once treatment is completed; hair may be different texture or color  
- About local support groups such as ACS  
- To get a wig and start wearing before hair loss is severe |
| Monitor GI problems. (Antineoplastics attack fastest growing cells in body, which includes cells in GI tract.) | Teach patient and caregivers:  
- Measures to obtain adequate nutrition, such as supplements, frequent small meals, high-calorie liquids, etc.  
- To take anti-emetic as soon as nausea occurs, not to wait until severe vomiting occurs |
| Monitor IV site for extravasation. (Can cause tissue necrosis secondary to severe irritation if medication gets into tissues.) | Instruct patient to immediately report any pain, discomfort, redness, swelling at IV site during administration or after administration is complete. |
| Monitor for herpes zoster or chickenpox. | Advise patient to: |
(If patient exposed, could experience severe case of the disease secondary to fact that patient’s decreased immune status does not allow ability to fight off any viral invasion.)

| • Avoid vaccinations while receiving vincristine  
| • Avoid persons with chickenpox  
| • Inform household members that they should not receive live virus vaccinations while patient receiving vincristine |

**Evaluation of Outcome Criteria**
Evaluate the effectiveness of drug therapy by confirming that patient goals and expected outcomes have been met (see “Planning”).
## Nursing Process Focus: Patients Receiving TAMOXIFEN (Nolvadex)

### Assessment
Prior to administration:
- Obtain complete health history including allergies, drug history and possible drug interactions
- Assess for presence or history of breast cancer

### Potential Nursing Diagnoses
- Anxiety, related to uncertain future, body image changes secondary to tamoxifen
- Knowledge, deficient, related to no previous contact with tamoxifen or any other drug taken as prophylaxis
- Nutrition, imbalanced, less than body requirements, related to nausea and vomiting secondary to tamoxifen
- Pain, acute, related to tumor flare
- Sexual dysfunction, male, related to side effects of tamoxifen

### Planning: Patient Goals and Expected Outcomes
Patient will:
- Demonstrate improved quality of life while on tamoxifen therapy,
- Complete recommended course of therapy
- Demonstrate knowledge of drug therapy and adverse reactions
- Maintain adequate nutrition
- Demonstrate maintenance of positive body image

### Implementation

<table>
<thead>
<tr>
<th>Interventions and (Rationales)</th>
<th>Patient Teaching/Discharge Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advise patient to be tested for estrogen-positive receptors. (Tamoxifen is more effective in tumors with high concentrations of positive estrogen receptors.)</td>
<td>Advise patient of importance of having estrogen receptors tested.</td>
</tr>
</tbody>
</table>
| Monitor for tumor flare. (Increased bone pain or increased tumor size may occur at beginning of therapy, secondary to high doses of tamoxifen being present in those areas.) | Advise patient and caregiver:  
  - That increased bone pain or increased tumor size may occur at beginning of therapy that these symptoms will stop on their own  
  - To report symptoms so analgesia can be ordered |
| Monitor for vision changes. (Decreased vision may be an irreversible adverse reaction to tamoxifen.) | Instruct patient to:  
  - Have eye exam before beginning tamoxifen therapy and periodically during therapy  
  - Report immediately any decreased vision |
| Monitor for vaginal bleeding in post-menopausal woman. (Although tamoxifen is an anti-estrogen, it acts similar to estrogen in body, simulating menstruation.) | Instruct patient that vaginal bleeding is not normal and she must report it immediately. |
| **Monitor for other GU problems including menstrual irregularities, impotence, erectile dysfunction.** | **Advise patient:**
- That there is an increased risk of endometrial cancer with tamoxifen therapy so she can make informed decision
- To report any changes in normal menstrual cycle
- To report impotence |
|---|---|
| **Monitor for other side effects/adverse reactions.** | **Advise patient:**
- That side effects may occur, and to report them: hot flashes, weight gain, pruritis, vaginal discharge
- They will stop when tamoxifen no longer being taken
- That some problems may not be due to tamoxifen (such as chest pain), so it is important to note them and report |
| **Monitor lab values. (CBC must be done weekly. If WBC <3500-4000, dose of tamoxifen must be held. Be aware that incorrect increased serum calcium levels, or increased T₄ results in absence of hyperthyroidism may be reported.)** | **Instruct patient:**
- That appointments for lab studies must be kept
- If showing signs of myelosuppression (fever, unusual fatigue, sore throat, etc.), avoid infections, etc. by staying away from people with URIs, staying out of wind or extremes of temperature, getting adequate rest |
| **Monitor for photophobia. (Tamoxifen causes increased sensitivity to sunlight.)** | **Advise patient to wear sunscreen, sunglasses, long sleeves when out in sun.** |
| **Monitor for commitment to tamoxifen therapy. (At current time, tamoxifen is recommended to be taken for 5 years.)** | **Advise patient that he/she must be committed to taking tamoxifen for long period of time, and to other restrictions associated with it: preventing pregnancy, routine lab studies, medical follow-ups, etc.** |

**Evaluation of Outcome Criteria**

Evaluate the effectiveness of drug therapy by confirming that patient goals and expected outcomes have been met (see “Planning”).