**Nursing Process Focus:**
**Patients Receiving Calcium Gluconate**

<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.  
  - Obtain a baseline ECG  
  - Obtain baseline vital signs, especially apical pulse for rate and rhythm, and blood pressure  
  - Obtain lab work to include complete blood count and electrolytes, esp. calcium  
  - Assess for side effects of medications, i.e., nausea, vomiting, and constipation | *Risk for Injury, related to softening bones and side effects of drug  
*Deficient Knowledge, related to drug’s effects and side effects |

**Planning: Patient Goals & Expected Outcomes**

Patient will  
- Have normal serum calcium levels (8.5 – 11.5 mg/dL)  
- Demonstrate an understanding of the drug’s action by accurately describing drug side effects and precautions, and measures to take to decrease any side effects  
- Immediately report side effects and adverse reactions

<table>
<thead>
<tr>
<th>Implementation</th>
<th>Patient Education &amp; Discharge Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Monitor electrolytes throughout therapy. (Calcium and phosphorus levels tend to vary inversely. Low magnesium levels tend to coexist with low calcium levels Normal calcium levels are usually set at 8.5 - 11.5 mg/dL)</em></td>
<td><em>Advise patient of importance of routine lab studies, so any deviations from normal can be noted and corrected immediately</em></td>
</tr>
<tr>
<td><em>Monitor for signs and symptoms of hypercalcemia</em></td>
<td><em>Instruct patient to report the following signs or symptoms of hypercalcemia: drowsiness, lethargy, weakness, headache, anorexia, nausea and vomiting, increased urination, and thirst</em></td>
</tr>
<tr>
<td><em>Initiate seizure precautions (padded rails, suction) for patients at risk for hypocalcemia,</em></td>
<td><em>Teach patient to be aware of signs of hypocalcemia, such as seizures muscle spasms, facial twitching, paresthesias</em></td>
</tr>
</tbody>
</table>
| *Monitor for musculoskeletal difficulties. (Calcium gluconate is used to treat osteoporosis, rickets, osteomalacia.)* | Instruct patient to:  
* take special precautions to prevent fractures, including pathologic fractures.  
* report any episodes of sudden pain, joints out of alignment, inability of patient to assume normal positioning* |
| *Monitor intake and output. Use cautiously in patient with renal insufficiency* | Instruct patient to  
* report any difficulty in urination  
* measure I&O* |
<p>| <em>Monitor cardiac functioning. Possible side effects may include short QT wave, heart block, hypotension, dysrhythmia or cardiac arrest with IV administration.</em> | <em>Inform patient to recognize and report side effects to health care provider</em> |
| <em>Ensure that medication is taken/administered correctly</em> | <em>Inform patients that oral calcium supplements should be taken with meals or within an hour</em> |</p>
<table>
<thead>
<tr>
<th>Action</th>
<th>Following meals</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Monitor IV site (intravenous administration) for infiltration.</td>
<td>*Instruct patient to report any pain at IV site</td>
</tr>
<tr>
<td>Extravasation may lead to necrosis.</td>
<td></td>
</tr>
<tr>
<td>*Monitor diet.</td>
<td>Advise patient to:</td>
</tr>
<tr>
<td>(Consuming calcium-rich foods will increase effect of drug.</td>
<td>*consume calcium-rich foods</td>
</tr>
<tr>
<td>Consuming foods rich in zinc may decrease calcium absorption.)</td>
<td>*avoid zinc-rich foods</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 Calcitriol (Rocaltrol, Calcijex)

<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 hypercalcemia, hypocalcemia, vitamin D toxicity, parathyroid dysfunction, decreased renal function.  
• Assess lab values of electrolytes, cholesterol, alkaline phosphatase, calcium, and creatinine. |  
• Deficient Knowledge, related to no previous contact with calcitriol  
• Ineffective Therapeutic Regimen Management, related to length of time treatment is necessary  
• Impaired Urinary Elimination (frequency), related to effects of drug |

#### Planning: Patient Goals and Expected Outcomes

Patient will:  
• Demonstrate increased bone mass.  
• Demonstrate knowledge of dietary modifications to include adequate calcium and Vitamin D.  
• Demonstrate understanding of drug treatment regimen.  
• Remain free of physical discomfort.  
• Maintain urinary elimination within normal limits.

#### Implementation

<table>
<thead>
<tr>
<th>Interventions and (Rationales)</th>
<th>Patient Education/Discharge Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Evaluate patient knowledge about proper storage. (Improper storage will render calcitriol ineffective.)</td>
<td>*Instruct patient to protect medication from light, heat and moisture.</td>
</tr>
</tbody>
</table>
| *Monitor diet for adequate calcium and phosphate content. (Effectiveness of calcitriol therapy depends on adequate daily intake of calcium and phosphate.) | Advise patient:  
• to include foods high in calcium and phosphate.  
• to avoid foods high in sodium or potassium.  
• to increase fluids, unless advised not to by health care provider.  
• symptoms of hypercalcemia, deep bone and flank pain, anorexia, nausea and vomiting, unusual thirst, constipation, lethargy, psychosis. |
| *Monitor for hypercalcemia. (Hypercalcemia is a sign of calcitriol overdose.) | *Advise patient to monitor for renal calculi (severe flank pain, hematuria) pathologic fractures (bradycardia decreased muscle tone. |
| *Monitor vitamin D intake. (Excessive intake of vitamin D may lead to hypercalcemia.) | *Advise patient to avoid any other sources of vitamin D therapy while taking calcitriol. |
| *Monitor for side effects/adverse reactions. | *Instruct patient and caregiver to monitor for and report: headache, weakness, irritability, somnolence, conjunctivitis, photophobia, rhinorrhea, anorexia, |


<table>
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<tr>
<th></th>
<th>nausea/vomiting, constipation, weight loss, polydipsia, dry mouth, metallic taste, polyuria, nocturia, bone and muscle pain, pruritis, decreased libido.</th>
</tr>
</thead>
</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 Raloxifene (Evista)

**Assessment**

Prior to administration:
- Obtain complete health history including allergies, drug therapy and possible drug interactions.
- Assess for presence, history of pregnancy, venous thrombosis, pulmonary emboli, hormone use, breast abnormalities.
- Obtain vital signs.
- Obtain history of cardiovascular or cerebrovascular disease.

**Potential Nursing Diagnoses**

- Excess Fluid Volume, related to water and sodium retention secondary to drug
- Deficient Knowledge, related to no previous contact with drug
- Nausea, related to side effects of raloxifene
- Disturbed Thought Processes (depression), related to side effects of drug

**Planning: Patient Goals and Expected Outcomes**

Patient will:
- Demonstrate bone density within normal limits.
- Demonstrate understanding of need for long-term compliance with medication regime.
- Demonstrate understanding of side effects/adverse reactions to report to health care provider.
- Maintain intact thought processes and absence of symptoms of depression.

**Implementation**

<table>
<thead>
<tr>
<th>Interventions and (Rationales)</th>
<th>Patient Education/Discharge Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Monitor bone density tests and liver function tests.</em></td>
<td><em>Instruct patient to have bone density tests and liver function tests prior to beginning raloxifene and periodically during therapy.</em></td>
</tr>
<tr>
<td><em>Monitor for thromboembolism. (This may indicate need to discontinue therapy.)</em></td>
<td><em>Advise patient about symptoms to report immediately: pain in calf; sudden dyspnea accompanied by feeling of breathlessness and impending doom; vision changes.</em></td>
</tr>
</tbody>
</table>
| *Monitor weight. (Edema may appear, and cause weight gain.)* | Teach patient and caregivers:
  - how to perform accurate weights.
  - to report weekly weight gain >5 lbs. |
| *Monitor activity level. (Prolonged periods of immobility may increase risk of thromboembolism.)* | Advise patient:
  - to avoid sitting in one position for long period.
  - to increase exercise if able and to do weight-bearing exercises, or to use weights when exercising. |
| *Obtain smoking history. (Smoking has an inverse effect on bone density.)* | Encourage patient:
  - to stop smoking.
  - to attend smoking-cessation clinics, courses, etc. |
| *Monitor for hot flashes. (Raloxifene does not prevent, and may induce, hot flashes.)* | Teach patient:
  - that raloxifene does not help decrease severity of hot flashes.
  - measures that may increase comfort: dressing in layers, explaining |
<table>
<thead>
<tr>
<th></th>
<th>physiology of hot flashes, drinking cool liquids, keeping thermostats turned lower than normal, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Monitor for GU complaints. Patient may experience breast pain, vaginal burning, or itching, UTI. (Raloxifene exhibits selective estrogen receptor antagonist activity on breast and uterus.)</td>
<td>*Advise patient to increase fluid intake, drink cranberry juice, practice careful personal hygiene, wear a supportive bra.</td>
</tr>
<tr>
<td>*Monitor diet for calcium content. (It may be recommended that patient take a calcium supplement if diet is low in calcium.)</td>
<td>*Advise patient to consume foods with high calcium content, especially milk and milk products, and leafy green vegetables.</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 Etidronate (Didronel)

#### Assessment
Prior to administration:
- Obtain complete health history including allergies, drug history and possible drug interactions.
- Assess for presence/history of pathologic fractures, hypocalcemia, hypercalcemia.
- Assess nutritional status.
- Obtain lab work to include complete blood count, pH, electrolytes and renal function studies (BUN, creatinine, uric acid.)
- Assess lab values of calcium and phosphorous.

#### Potential Nursing Diagnoses
- Deficient Knowledge, related to no prior exposure
- Risk for Imbalanced Fluid Volume, related to adverse reaction to drug
- Nausea, related to side effects of drug
- Pain (acute, bone), related to adverse reaction to etidronate
- Ineffective Therapeutic Regimen Management, related to fact that therapeutic response may take 1-3 months

#### Planning: Patient Goals and Expected Outcomes
Patient will:
- Demonstrate decreased progression of osteoporosis or Paget’s disease.
- Demonstrate decreased risk for pathologic fractures.
- Remain free of side effects or adverse reactions.
- Demonstrate understanding of dietary needs/modifications.
- Maintain adequate fluid volume.

#### Implementation

<table>
<thead>
<tr>
<th>Interventions and (Rationales)</th>
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</thead>
<tbody>
<tr>
<td><em>Monitor for pathologic fractures and bone pain. (Etidronate causes defective mineralization of newly formed bone.)</em></td>
<td><em>Instruct patient and caregiver to report any sudden bone or joint pain, inability of patient to correctly position self, swelling over bone or joint.</em></td>
</tr>
<tr>
<td><em>Monitor for GI problems. (There may be problems with etidronate absorption if patient has persistent nausea or diarrhea.)</em></td>
<td><em>Advise patient and caregiver that new onset nausea or diarrhea may be symptom of adverse reaction, and to report immediately.</em></td>
</tr>
</tbody>
</table>
| *Monitor serum calcium lab values: Serum calcium levels should be 9-10mg/dl. (Through its inhibition of bone resorption, etidronate causes blood levels of calcium to fall.)* | Advise patient:  
  - to have lab studies performed prior to beginning etidronate therapy and periodically during therapy.  
  - symptoms of hypocalcemia to report (muscle spasms, facial grimacing, convulsions, irritability, depression, psychoses).  
  - symptoms of hypercalcemia to report (increased bone pain, anorexia, nausea/vomiting, constipation, thirst, lethargy, fatigue, confusion, depression.) |
<p>| <em>Monitor kidney function, especially creatinine. (Etidronate cannot be used in...</em> | <em>Instruct patient and caregiver to report any urinary changes, such as decreased urine...</em> |</p>
<table>
<thead>
<tr>
<th>Patients whose creatinine is &gt;5.</th>
<th>Production, increased urination.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Monitor BUN, vitamin D, urinalysis, phosphate, magnesium levels.</td>
<td></td>
</tr>
</tbody>
</table>
### Nursing Process Focus:
**Patients Receiving Hydroxychloroquine Sulfate (Plaquinil Sulfate)**

#### Assessment
Prior to administration:
- Obtain complete health history including allergies, drug history and possible drug interactions.
- Assess for presence/history of malaria, rheumatoid arthritis, lupus erythematosus.
- Assess mental status.
- Assess GI status.
- Assess CBC, platelets, liver function tests, vision and hearing tests G6PD deficiency, muscle strength, reflexes, EKG (depressed T waves, widening of QRS complex.)

#### Potential Nursing Diagnoses
- Deficient Fluid Volume, related to diarrhea, anorexia, nausea, vomiting secondary to drug
- Deficient Knowledge, related to no previous contact with this drug
- Imbalanced Nutrition: Less than Body Requirements, related to anorexia, nausea, vomiting, diarrhea secondary to drug
- Disturbed Sensory Perception (vision and/or hearing), related to adverse reactions of drug

#### Planning: Patient Goals and Expected Outcomes
Patient will:
- Experience no symptoms of malarial infection.
- Experience decreased symptoms of rheumatoid arthritis with increased joint mobility.
- Experience decreased symptoms of lupus erythematosus.
- Demonstrate understanding of necessity of taking hydroxychloroquine exactly as ordered.
- Recognize side effects and need to report.
- Demonstrate understanding of necessity of follow-up appointments.

#### Implementation

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<tbody>
<tr>
<td>*Monitor for hepatic problems, actual or potential. (Administer medication with caution to patients with decreased liver function, any patient taking hepatotoxic drugs, or alcoholic patient.)</td>
<td>*Instruct patient to report symptoms of liver dysfunction to health care provider.</td>
</tr>
</tbody>
</table>
| *Monitor patient and family knowledge regarding expected effects of medication. | Advise patient and caregiver: 
  - that urine may turn rust or brown. 
  - to wear sunglasses outside to decrease photophobia. 
  - to report symptoms of blood dyscrasias (fever, fatigue, bruising, unusual bleeding.) |
| *Monitor for symptoms of toxicity. | *Instruct patient to discontinue drug and report to health care provider immediately if any of following occur: blurred vision and difficulty focusing, headache, dizziness, urticaria. |

#### 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 Colchicine

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Potential Nursing Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to administration:</td>
<td>• Activity Intolerance, related to joint pain</td>
</tr>
<tr>
<td>• Obtain complete health history including allergies, drug history and possible drug interactions.</td>
<td>• Disturbed Body Image, related to joint swelling</td>
</tr>
<tr>
<td>• Obtain baseline vital signs</td>
<td>• Deficient Knowledge, related to drug’s effects and side effects</td>
</tr>
<tr>
<td>• Obtain lab work to include complete blood count platelets, uric acid levels, renal and liver function tests, and UA</td>
<td></td>
</tr>
</tbody>
</table>

**Planning: Patient Goals & Expected Outcomes**

Patient will

- Report a decrease in pain and loss of function in affected joints
- Demonstrate an understanding of the drug’s action by accurately describing drug side effects and precautions, and measures to take to decrease any side effects
- Immediately report side effects and adverse reactions

**Implementation**

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>*Monitor lab results throughout therapy: CBC, platelets, liver and renal function tests. (Agranulocytosis and thrombocytopenia may occur.) Perform Coombs test for hemolytic anemia</td>
<td>*Teach patient importance of routine lab studies, so any deviations from normal can be noted and corrected immediately</td>
</tr>
<tr>
<td>*Monitor for signs of toxicity</td>
<td>*Instruct patient to report the following signs of toxicity: weakness, abdominal pain, nausea, and/or diarrhea</td>
</tr>
<tr>
<td>*Monitor for signs of renal damage such as oliguria.</td>
<td>Instruct patient to</td>
</tr>
<tr>
<td>*Record intake and output.</td>
<td>• report a decrease in urinary output</td>
</tr>
<tr>
<td>*Ensure that medication is administered correctly</td>
<td>• increase fluid intake to 3-4 liters a day</td>
</tr>
<tr>
<td>*Monitor for pain and mobility. (May indicate effectiveness of medication regimen.)</td>
<td>*Inform patients to take medication on an empty stomach. Medication should be taken at first sign of gout attack.</td>
</tr>
<tr>
<td></td>
<td>*Teach patient to report an increase or decrease in discomfort and swelling</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”)