**darbepoetin** (dar-be-poh-e-tin)

**Therapeutic Class:** antianemics

**Pharmacologic Class:** hormones (rDNA), erythropoiesis stimulating agents (ESA)

**Pregnancy Category C**

**Indications**
- Anemia associated with chronic kidney disease (CKD)
- Chemotherapy-induced anemia in patients with non-myeloid malignancies

**Action**
- Stimulates erythropoiesis (production of red blood cells).

**Therapeutic Effects:**
- Maintains and may elevate red blood cell counts, decreasing the need for transfusions.

**Pharmacokinetics**

- **Absorption:** 30– 50% following subcut administration; IV administration results in complete bioavailability.
- **Distribution:** Confined to the intravascular space.
- **Metabolism and Excretion:** Unknown.
- **Half-life:** Subcut—49 hr; IV—21 hr.

**TIME/ACTION PROFILE (q in RBCs)**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
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<tbody>
<tr>
<td>IV, Subcut</td>
<td>2–6 wk</td>
<td>unknown</td>
<td>unknown</td>
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**Contraindications/Precautions**

- **Contraindicated in:** Hypersensitivity; Uncontrolled hypertension; Patients receiving chemotherapy when anticipated outcome is cure.

- **Use Cautiously in:** Cardiovascular disease or stroke; Underlying hematologic diseases, including hemolytic anemia, sickle-cell anemia, thalassemia and porphyria (safety not established); OB, Lactation, Pedi: Safety not established.

**Side Effects**

- **CNS:** SEIZURES, dizziness, fatigue, headache, weakness.
- **Resp:** cough, dyspnea, bronchitis.
- **CV:** HF, MI, STROKE, THROMBOEMBOLIC EVENTS (especially with hemoglobin <11 g/dL), edema, hypertension, hypotension, chest pain, abdominal pain, nausea, vomiting, diarrhea, fever, hypotension, chest pain.
- **GI:** abdominal pain, nausea, diarrhea, vomiting, constipation.
- **Derm:** pruritus.
- **Hemat:** pure red cell aplasia.
- **MS:** myalgia, arthralgia, back pain, limb pain.
- **Misc:** allergic reactions, flu-like syndrome, sepsis, q mortality, q tumor growth (with hemoglobin <12 g/dL).

**Interactions**

- **Drug-Drug:** None reported.

**Route/Dosage**

- **Anemia due to Chronic Renal Failure**
  - Do not initiate if hemoglobin <10 g/dL.
  - **IV, Subcut (Adults):** Starting treatment with darbepoetin (no previous epoetin)—0.45 mcg/kg once weekly (may start with 0.75 mcg/kg q2w in patients not on dialysis); use lowest dose sufficient to decrease need for red blood cell transfusions (do not exceed hemoglobin of 10 g/dL [patients on dialysis] or 11 g/dL [patients not on dialysis]); IV dose by +1.0 g/dL in 2 wk, IV dose by 25%; if IV dose by +1.0 g/dL after wk of therapy (end of adequate iron stores); dose by 25%; do not dose more frequently than q 4 wk. Conversion from epoetin to darbepoetin—weekly epoetin dose <200 units = 0.25 mcg/week darbepoetin, weekly epoetin dose 200–10,000 units = 25 mcg/week darbepoetin, weekly epoetin dose 10,000–35,999 units = 50 mcg/week darbepoetin, weekly epoetin dose 36,000–89,999 units = 100 mcg/week darbepoetin, weekly epoetin dose >90,000 units = 200 mcg/week darbepoetin.

- **Anemia due to Chemotherapy**
  - Use only for chemotherapy-related anemia and discontinue when chemotherapy course is completed; do not initiate if hemoglobin <10 g/dL.
  - **Subcut (Adults):** 2.25 mcg/kg weekly or 500 mcg q 3 wk; target Hgb should not exceed 12 g/dL. IV dose by +1.0 g/dL in 2 wk or se reaches a level needed to avoid red blood cell transfusions; if IV dose by 40%; if IV dose by +1.0 g/dL after 6 wk of therapy; does not dose iv more frequently than q 4 wk.

**Adverse Reactions/Side Effects**


**Drug Interactions**

- None reported.
NURSING IMPLICATIONS

Assessment
● Monitor BP before and during therapy. Inform health care professional if severe hypertension is present or if BP begins to increase. Additional antihypertensive therapy may be required during initiation of therapy.
● Monitor response for symptoms of anemia (fatigue, dyspnea, pallor)
● Monitor shadow shows (thigh and brisk) and status of artificial kidney during hemodialysis. May need to increase heparin dose to prevent clotting. Monitor patients with underlying vascular disease for improved circulation.
● Monitor for allergic reactions (rash, urticaria). Discontinue darbepoetin if signs of anaphylaxis (chills, laryngeal edema) occur.
● Lab Test Considerations: May cause qin WBCs and platelets. May pbleeding times.
● Monitor serum ferritin, transferrin, and iron levels prior to and during therapy to assess need for concurrent iron therapy. Administer supplemental iron therapy if serum ferritin is <100 mcg/mL.
● Monitor hemoglobin before and weekly during initial therapy, for 4 wk after a change in dose, and regularly after target range has been reached and maintenance dose is determined. Monitor other hematopoietic parameters (Hb with differential and platelet count) before and periodically during therapy. (Hemoglobin ≥ 10.0 g/dL in any 2-week period or hemoglobin <10.0 g/dL in any 3-week period) until hemoglobin approaches level where RBC transfusions may be required and maintain at a dose >50% of the previous dose. If hemoglobin <10.0 g/dL, and remains below 10.0 g/dL after 4 weeks of therapy, ↓ dose to 4.5 mcg/kg/week (if no weekly therapy) or do not adjust dose (if on every 3-wk schedule). If there is no response as measured by hemoglobin levels or if RBC transfusions are still required after 4 weeks of therapy, following completion of a chemotherapy course, discontinue darbepoetin. Hemoglobin ≥11.0 g/dL increases the likelihood of life-threatening cardiovascular complications, cardiac arrest, neurologic events (seizure, stroke), hypertension, stroke, vascular thromboembolic events (stroke, MI, and fatal myocardial infarction).
● Only prescribers and hospitals enrolled in the ESA APPRISE Oncology Program can provide darbepoetin for patients with cancer. Visit www.esa-apprise.com or call 1-866-284-8089.

Implementation
● Direct IV: Administer as direct injection or bolus over 1–3 min into IV tubing or via venous line at end of dialysis session. If patient was receiving epoetin alfa 2–3 times/wk administer darbepoetin once/wk. If patient was receiving epoetin alfa once/wk, darbepoetin may be administered once every 2 wk. Route of administration should remain consistent.
● Dose adjustments should not be more frequent than once/month.
● Do not shake vial; inactivation of medication may occur. Do not administer vials containing solution that is discolored or contains particulate matter. Discard vial immediately after withdrawing dose. Do not pool unused portions.
● May be administered subcutaneously for patients not requiring dialysis.

Patient/Family Teaching
● Explain ESA APPRISE Oncology Program and the rationale for concurrent iron therapy (increased red blood cell production requires iron). Instruct patient to read the Abbreviated Guide prior to beginning therapy. Inform patients of risks

Potential Nursing Diagnoses

Activity intolerance (Indications)

Implementation
● Transfusions are still required for severe symptomatic anemia. Supplemental iron should be initiated with darbepoetin and continued during therapy. Correct deficiencies of folic acid or vitamin B12, prior to therapy.
● Institute seizure precautions in patients who experience greater than a 1.0 g/dL increase in hemoglobin in a 2-wk period or exhibit any change in neurologic status.
● For conversion from epoetin alfa to darbepoetin, if epoetin was administered ≥3 times/wk administer darbepoetin once weekly. If patient was receiving epoetin alfa once/wk, darbepoetin may be administered once every 2 wk. Route of administration should remain consistent.
● Dose adjustments should not be more frequent than once/month.
● Do not shake vial; inactivation of medication may occur. Do not administer vials containing solution that is discolored or contains particulate matter. Discard vial immediately after withdrawing dose. Do not pool unused portions.

Subcut: This route is often used for patients not requiring dialysis.

IV Administration

pH: 5.0–6.4

Y-Site Incompatibility: Do not administer in conjunction with other drugs or solutions.
darbepoetin

and benefits of darbepoetin. Inform patients with cancer that they must sign the patient healthcare provider acknowledgment form before the start of each treatment course.  

Discuss possible return of menses and fertility in women of childbearing age. Patients should discuss contraceptive options with health care professional.  

Discuss ways of preventing self-injury in patients at risk for seizures. Driving and activities requiring continuous alertness should be avoided.  

Inform patient that use of darbepoetin may result in shortened overall survival and/or time to tumor progression. May also cause MI or stroke. Advise patient to notify health care professional immediately if chest pain, trouble breathing or shortness of breath, pain in legs, with or without swelling, a cool or pale arm or leg; sudden confusion, trouble speaking, or trouble understanding others' speech; sudden numbness or weakness in face, arm, or leg, especially on one side of body; sudden trouble seeing; sudden trouble walking, dizziness, loss of balance or coordination; loss of consciousness (fainting); or hemodialysis vascular access stops working.  

Anemia of Chronic Kidney Disease: Stress importance of compliance with dietary restrictions, medications, and dialysis. Foods high in iron and low in potassium include liver, pork, veal, beef, mustard and turnip greens, peas, eggs, broccoli, kale, blackberries, strawberries, apple juice, watermelon, cantaloupe, and enriched bread. Darbepoetin will result in increased sense of well-being, but it does not cure underlying disease.  

Home Care Issues: Home dialysis patients determined to be able to safely and effectively administer darbepoetin should be taught proper dose, administration technique with syringe or auto-injector and disposal of equipment. Information for Patients and Caregivers should be provided to patient along with medication.

Evaluation/Desired Outcomes

Increase in hemoglobin not to exceed 11 g/dL, with improvement in symptoms of anemia in patients with chronic renal failure or with chemotherapy-induced anemia.

Why was this drug prescribed for your patient?