

ERYTHROPOIETIN

Class: Colony Stimulating Factor; Erythropoiesis-Stimulating Agent (ESA); Growth Factor; Recombinant Human Erythropoietin

Indications:

Treatment of anemia due to concurrent myelosuppressive chemotherapy in patients with cancer (nonmyeloid malignancies) receiving chemotherapy (palliative intent) for a planned minimum of 2 additional months of chemotherapy; treatment of anemia due to chronic kidney disease (including patients on dialysis and not on dialysis) to decrease the need for RBC transfusion; treatment of anemia associated with HIV (zidovudine) therapy when endogenous erythropoietin levels ≤ 500 mUnits/mL; reduction of allogeneic RBC transfusion for elective, noncardiac, nonvascular surgery when perioperative hemoglobin is >10 to ≤ 13 g/dL and there is a high risk for blood loss

Unlabeled Indications : Treatment of symptomatic anemia in myelodysplastic syndrome (MDS)

Available dosage form in the hospital:

- ERYTHROPOIETIN 10000 IU PFS
- ERYTHROPOIETIN 2000 IU VIAL
- ERYTHROPOIETIN 2000 IU/0.3ML PFS
- ERYTHROPOIETIN 4000 IU PFS
- ERYTHROPOIETIN 4000 IU VIAL
- ERYTHROPOIETIN 40000 IU PFS
- ERYTHROPOIETIN 5000 IU VIAL
- ERYTHROPOIETIN 5000 IU/0.3ML PFS

Dosage:

Anemia associated with chronic kidney disease: Individualize dosing and use the lowest dose necessary to reduce the need for RBC transfusions.

-*Chronic kidney disease patients ON dialysis* (I.V. route is preferred for hemodialysis patients; initiate treatment when hemoglobin is <10 g/dL; reduce dose or interrupt treatment if hemoglobin approaches or exceeds 11 g/dL): I.V., SubQ: Initial dose: 50-100 units/kg 3 times/week

-*Chronic kidney disease patients NOT on dialysis* (consider initiating treatment when hemoglobin is <10 g/dL; use only if rate of hemoglobin decline would likely result in RBC transfusion and desire is to reduce risk of alloimmunization or other RBC transfusion-related risks; reduce dose or interrupt treatment if hemoglobin exceeds 10 g/dL): I.V., SubQ: Initial dose: 50-100 units/kg 3 times/week

-*Dosage adjustments for chronic kidney disease patients (either on dialysis or not on dialysis):*

-If hemoglobin does not increase by >1 g/dL after 4 weeks: Increase dose by 25%; do not increase the dose more frequently than once every 4 weeks

-If hemoglobin increases >1 g/dL in any 2-week period: Reduce dose by $\geq 25\%$; dose reductions can occur more frequently than once every 4 weeks; avoid frequent dosage adjustments

-Inadequate or lack of response over a 12-week escalation period: Further increases are unlikely to improve response and may increase risks; use the minimum effective dose that will maintain a Hgb level sufficient to avoid RBC transfusions and evaluate patient for other causes of anemia. Discontinue therapy if responsiveness does not improve.

-Anemia due to chemotherapy in cancer patients: Initiate treatment only if hemoglobin <10 g/dL and anticipated duration of myelosuppressive chemotherapy is ≥ 2 months. Titrate dosage to use the minimum effective dose that will maintain a hemoglobin level sufficient to avoid red blood cell transfusions. Discontinue erythropoietin following completion of chemotherapy. SubQ: Initial dose: 150 units/kg 3 times/week or 40,000 units once weekly until completion of chemotherapy

Dosage adjustments:

-If hemoglobin does not increase by >1 g/dL **and** remains below 10 g/dL after initial 4 weeks: Increase to 300 units/kg 3 times/week or 60,000 units weekly;

discontinue after 8 weeks of treatment if RBC transfusions are still required or there is no hemoglobin response

-If hemoglobin exceeds a level needed to avoid red blood cell transfusion: Withhold dose; resume treatment with a 25% dose reduction when hemoglobin approaches a level where transfusions may be required.

-If hemoglobin increases >1 g/dL in any 2-week period or hemoglobin reaches a level sufficient to avoid red blood cell transfusion: Reduce dose by 25%.

-Anemia due to zidovudine in HIV-infected patients: Titrate dosage to use the minimum effective dose that will maintain a hemoglobin level sufficient to avoid red blood cell transfusions. Hemoglobin levels should not exceed 12 g/dL.

-Serum erythropoietin levels ≤ 500 mUnits/mL and zidovudine doses ≤ 4200 mg/week): I.V., SubQ: Initial: 100 units/kg 3 times/week; if hemoglobin does not increase after 8 weeks, increase dose by ~ 50 -100 units/kg at 4-8 week intervals until hemoglobin reaches a level sufficient to avoid RBC transfusion; maximum dose: 300 units/kg. Withhold dose if hemoglobin exceeds 12 g/dL, may resume treatment with a 25% dose reduction once hemoglobin <11 g/dL. Discontinue if hemoglobin increase is not achieved with 300 units/kg for 8 weeks.

-Surgery patients (perioperative hemoglobin should be >10 g/dL and ≤ 13 g/dL; DVT prophylactic anticoagulation is recommended): SubQ: Initial dose:

- 300 units/kg/day beginning 10 days before surgery, on the day of surgery, and for 4 days after surgery

or

- 600 units/kg once weekly for 4 doses, given 21-, 14-, and 7-days before surgery, and on the day of surgery

-Symptomatic anemia associated with myelodysplastic syndrome (unlabeled use): SubQ: 40,000-60,000 units 1-3 times/week.

Geriatric

Refer to adult dosing.

Renal impairment:

No dosage adjustment in renal impairment provided in manufacturer's labeling.

Hepatic impairment:

No dosage adjustment in hepatic impairment provided in manufacturer's labeling.

Common side effects:

- Cardiovascular: Hypertension
- Central nervous system: Fever, headache
- Dermatologic: Pruritus, rash
- Gastrointestinal: Nausea, vomiting
- Local: Injection site reaction
- Neuromuscular & skeletal: Arthralgia
- Respiratory: Cough

Pregnancy Risk Factor: C