Guidelines for the use of haemopoietic growth factors (Erythropoietin) in ADULTS

Erythropoietin (epoietin or EPO) in the management of cancer related anaemia

Chronic anaemia resulting from cancer, or its treatment, is an important clinical problem. Blood transfusions are the traditional and fastest method of alleviating symptoms however studies have shown that erythropoietin can increase haemoglobin (Hb) levels and reduce the need for transfusion. Erythropoeitin is a haematological growth factor that regulates proliferation, maturation and differentiation of red blood cells.

Symptoms of anaemia can include fatigue, drowsiness, light-headedness, inability to concentrate, lassitude, dyspnoea and tachycardia.

NICE: Erythropoietin analogues with iron injections are recommended, within their marketing authorisations, as options for treating anaemia in people with cancer who are having chemotherapy

Definition of response rate:

Absolute increase in haemoglobin (Hb) ≥2g/dl
and / or elimination of transfusion requirements

Predicting which patients will respond is not always possible, though patients with high erythropoietin levels (>100mIU/ml) prior to treatment are unlikely to benefit.

Patients showing a rise in Hb of >0.5g/dl after 2 weeks usually respond well to long-term treatment. (After 4 weeks a rise in Hb of >1g/dl).

A smaller rise in Hb indicates a poorer long-term response and epoeitin should be discontinued.

Patient selection

Non-curative intent patients with chemotherapy induced anaemia, a solid tumour, malignant lymphoma, or multiple myeloma, and at risk of transfusion as assessed by the patient's general status (e.g. cardiovascular status, pre-existing anaemia at the start of chemotherapy) for the treatment of anaemia and reduction of transfusion requirements.

Contraindications: poorly controlled hypertension.

Cautions: epilepsy, thrombocytosis, thromboembolism and chronic liver failure.

Before starting

- The following tests may be done and the results obtained, before erythropoietin can be initiated by a Consultant.
- Ensure the patient has adequate iron stores, give supplementation.
- Check all other causes of anaemia have been excluded and correct any haemodynamic deficiency.
- Check folate and vitamin B_{12} levels, additional supplementation may be required.
- It must be made clear to the patient, at initiation, that therapy will be stopped after 4-8 weeks of treatment if there is no response (response being defined as a Hb increase >1g/dl at 4-8 weeks).

Acknowledgements to NW Yorkshire

Dosage and administration (according to local preferences)
Epoetin alfa (Eprex®) 150u/kg 3 x week (or 450u/kg 1 x week), increase to 300u/kg 3 x week SC.
Epoetin beta (NeoRecormon®) 450u/kg weekly in 3–7 divided doses increase, to 900u/kg 3–7 divided doses (in haematological malignancies the entire lower weekly dose may be given once weekly, the higher weekly dose in 2-7 divided doses) SC.
Epoetin zeta (Retacrit®) 150u/kg 3 x week (or 450u/kg 1 x week) SC
Darbepoietin (Aranesp®) 6.75mcg/kg every 3 weeks if ineffective stop (or 2.75mcg/kg once weekly increasing to 4.5mcg/kg once weekly) SC.

Assess at 4 weeks:
- If Hb decreases ≥1g/dl then further therapy may not be effective therapy and so stop erythropoietin.
- If Hb increases >1g/dl, continue at the same dose reviewing the patient monthly.
- If Hb increase is not > 1g/dl, increase dose as above and review after 4 weeks. If after 4 weeks at increased dose the Hb increase is not >1g/dl, then stop erythropoietin.
- If Hb increases >2g/dl in 4 weeks, reduce erythropoietin dose by 25-50%.
- If Hb >13g/dl, discontinue therapy until it falls below 12g/dl then re-start with a dose reduction of 50%

Failure to respond at 4 weeks should lead to a careful assessment of other causes of anaemia / poor response to erythropoietin – haematinic deficiency, GI blood loss, haemolysis, splenomegaly.

Monitoring - monthly
- Blood pressure
- Ferritin and/or % hypochromic RBCs, free erythrocyte protoporphyrin
- FBC, reticulocytes, blood film, platelets

Duration of treatment
- Initially prescribe for 4 weeks then review patient, if the patient has not responded increase dose as above for 4 weeks and review. If patient has not responded to 4 weeks of increased dose then **stop**.
- If patient has responded continue erythropoietin, monitoring and reviewing the patient monthly, until 3 weeks (solid tumours) or 4 weeks (haematological malignancies) after the last cycle of chemotherapy then **stop** erythropoietin.

Transfusion policy whilst on EPO
- RBC transfusion when Hb <8g/dl or symptoms of anaemia
  - during the first 4 weeks, this does NOT constitute failure of erythropoietin therapy as it may take this time to start to see a response.

NB There is a separate guideline ‘Use of erythropoietin in myelodyspastic syndrome’
on the myeloid page in the Operational policy and guideline section:
https://thamesvalleycanceralliance.nhs.uk/healthcare-professionals/haematological-cancer/