### Darbepoetin Alpha

**Generic (Trade Name):** Darbepoetin Alpha (Aranesp®)  
**Manufacturer:** Amgen Inc.  
**Indication:** For the treatment of anemia associated with chronic renal failure, including patients on dialysis and in patients not on dialysis.  
**Current Regulatory Status:** Darbepoetin alpha received FDA approval in September 2001 for the above indication. An application has also been submitted for the indication of anemia associated with cancer chemotherapy. The European Agency has also approved this product and it is currently available in a number of European markets. In conversation with the company, Amgen states that they have submitted an application for marketing approval in Canada, and anticipate it becoming available in 2002.  
**Description:** Chronic renal failure patients, both dialysis and non-dialysis dependent, often develop anemia. To address this issue, erythropoiesis stimulating proteins were developed. The first marketed agent was epoetin alpha; it is an efficacious agent, however, it requires frequent dosing.  
Darbepoetin alpha (novel erythropoiesis stimulating protein, NESP) is a modified analog of epoetin, containing two additional N-glycosylation sites. This change allows for a prolonged clearance, allowing for once weekly administration. Similar to its predecessor it interacts with stem cells of the bone marrow, increasing red blood cell production.  
**Current Treatment(s):** Most end stage renal disease patients will require either oral or intravenous iron replacement (Venofer® - Lutipold Pharmaceuticals, Dexiron® - Lutipold Pharmaceuticals, Infufer® - Sabex). Other management options include initiating epoetin alpha (Eprex®) - Janssen-Ortho. Prior to the availability of epoetin, blood transfusions were utilized. Most patients also receive multivitamins containing both folic acid and vitamin B12.  
**Cost:** As this product is not currently available in Canada, no Canadian price can be obtained at this time. In the U.S. darbepoetin alpha is available as single-dose 1 mL vials containing 25, 40, 60, 100 and 200 mcg. The American list price for this product is approximately $3.99 per mcg. The drug cost for a patient requiring 5,000 to 10,999 units per week of erythropoietin would be approximately $804 to US $1,769 for 12 weeks of treatment. The corresponding dose of darbepoetin alpha of 25 mcg/week would cost $1,496 for the same time frame. Suggested doses of darbepoetin are available in the product prescribing information to give guidance on an equivalent dose based on previously effective epoetin requirement.
EVIDENCE

Numerous clinical studies have been conducted examining the safety and efficacy of darbepoetin alpha in patients with anemia associated with chronic renal failure. Several scenarios have been examined including using darbepoetin de novo, for conversion from erythropoetin, and to examine the success of the product in maintaining a long term response. Most were conducted in an open-label fashion, however an abstract is available discussing a double-blind trial. In the 28-week study, hemodialysis patients (n=507) were randomized to receive either darbepoetin once weekly or continue epoetin thrice weekly titrated to maintain desired hemoglobin (90-130g/L). The median weekly darbepoetin alpha dose was 0.53 mcg/kg. Preliminary work regarding usage of darbepoetin alpha in oncology patients who subsequently developed anemia has shown favourable results.

COMMENTARY:

Clinical trial data available thus far have shown that darbepoetin possesses comparable clinical activity to epoetin, with a similar tolerability profile. Although no safety or efficacy advantage has come to light, its less frequent dosing schedule may be attractive to some patients (i.e. those that are not hemodialysis dependent or require routine clinic visits).

REFERENCES:


This series highlights medical technologies that are not yet in widespread use in Canada and that may have a significant impact on health care. The contents are based on information from early experience with the technology; however, further evidence may become available in the future. These summaries are not intended to replace professional medical advice. They are compiled as an information service for those involved in planning and providing health care in Canada.