

Understanding our advice ~ August 2006

**The use of epoetinum alfa before
orthopaedic surgery in patients with
mild anaemia**

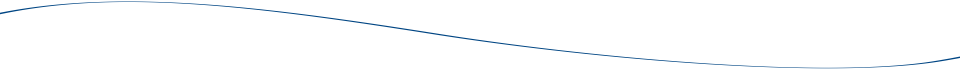
Purpose of this document

NHS Quality Improvement Scotland (NHS QIS) has issued advice to **NHSScotland** on treating anaemic patients with epoetinum alfa before orthopaedic surgery. This booklet has been produced to explain our advice to people who do not have specialist knowledge of this area.

It explains what anaemia is and why it needs to be treated before surgery, what epoetinum alfa is, how we formed our advice and the evidence we considered. It also explains what the advice means for people undergoing orthopaedic surgery.

The full evidence is discussed in detail in our report called Health Technology Assessment 8: The use of epoetinum alfa before orthopaedic surgery in patients with mild anaemia. Copies of the report are available from NHS QIS and on its website, www.nhsquality.org

The words in **bold** are explained in the Glossary at the end of this document.



What is anaemia and why is it a problem during orthopaedic surgery?

Red blood cells carry oxygen around the body and are important in keeping it healthy. Anaemia occurs where there is a reduction in the number of red blood cells.

Orthopaedic surgery involves operations on the bones, muscles and joints, with the most common being hip and knee replacements. During orthopaedic operations large amounts of blood can be lost and may need to be replaced by blood transfusion.

As anaemic patients already have low red blood cell levels, they are more likely to need a blood transfusion if there is bleeding during surgery. Anaemic patients are also more likely to have problems recovering after surgery. Anaemia should, therefore, be treated before a patient undergoes planned orthopaedic surgery.

Reducing the number of blood transfusions during orthopaedic surgery is important as problems with infection, reactions to the transfusion and errors in giving the transfusion occasionally arise. The risks of blood transfusion have been reduced by better blood treatment and handling methods and improved safety testing. Despite these improvements the risks can never be completely avoided.

Some patients cannot accept blood transfusions, either because of their religious beliefs or because suitable blood is difficult to find.

Orthopaedic surgery and blood transfusion in Scotland

The number of orthopaedic operations performed by NHSScotland gradually increased over the years 1992 to 2004, with 4,664 hip and 3,875 knee replacements being performed in 2004. Most of these operations were planned in advance (elective).

In 2003/2004 it was estimated that about 15% of the total amount of red blood cells used in Scotland was needed for hip and knee replacement surgery. Because the age of the Scottish population is rising there will be greater need for hip and knee surgery in the coming years. This also means that more blood will be needed for patients undergoing orthopaedic surgery.

A major problem with the use of donated blood is keeping enough in stock. Recently restrictions on people who can give blood have been introduced to reduce the likelihood of transfusion spreading infections and diseases such as CJD.

Better safety testing also means that the cost of collecting and producing red blood cells has risen, with one unit of blood costing £47 in 1998 and £120 in 2004.

Given the concerns over the availability of donated blood, the risks of using it and the cost, new ways of dealing with blood loss during orthopaedic surgery are required. Methods for reducing the amount of blood needed during surgery are often called 'blood-sparing technologies'.



Use of epoetinum alfa

Epoetinum alfa is a hormone that is normally produced in the body and makes cells in the bone marrow grow and develop into red blood cells, which are then released into the blood.

Epoetinum alfa is used medically to treat anaemia in patients who have kidney failure or are receiving cancer chemotherapy, or before planned orthopaedic surgery.

Mildly anaemic patients about to undergo orthopaedic surgery can be given an injection of epoetinum alfa, under the skin, each week for three or four weeks before surgery and on the day of surgery. Patients may also receive an iron supplement, to allow new red blood cells to be produced properly.

Treatment with epoetinum alfa increases red blood cell numbers in the weeks running up to elective surgery, which reduces the likelihood that the patient will require blood transfusion during or after the operation.

Epoetinum alfa is a blood-sparing technology as it reduces the need for a patient to be given donated blood during orthopaedic surgery. The estimated cost of a course of epoetinum alfa for an orthopaedic patient is about £1,340.

We reviewed studies that showed epoetinum alfa reduces the number of orthopaedic patients needing a blood transfusion compared to standard care. When the cost of epoetinum alfa treatment was balanced against the costs of blood transfusion, including those of treating any infections or transfusion reactions, it proved very expensive. It was estimated that the cost of blood would need to rise to over £2,750 per unit before epoetinum alfa became **cost effective**.

What we have recommended

We have recommended that epoetinum alfa is not generally used to treat mildly anaemic patients before planned orthopaedic surgery, because it is not value for money.

Epoetinum alfa should only be given to patients who are mildly anaemic and cannot receive blood transfusion, either due to their religious convictions or because suitable blood is unlikely to be available.

How we formed our advice

We used an internationally recognised process called **Health Technology Assessment** to form our advice. The assessment took account of the social, ethical, medical and economic implications of using epoetinum alfa.

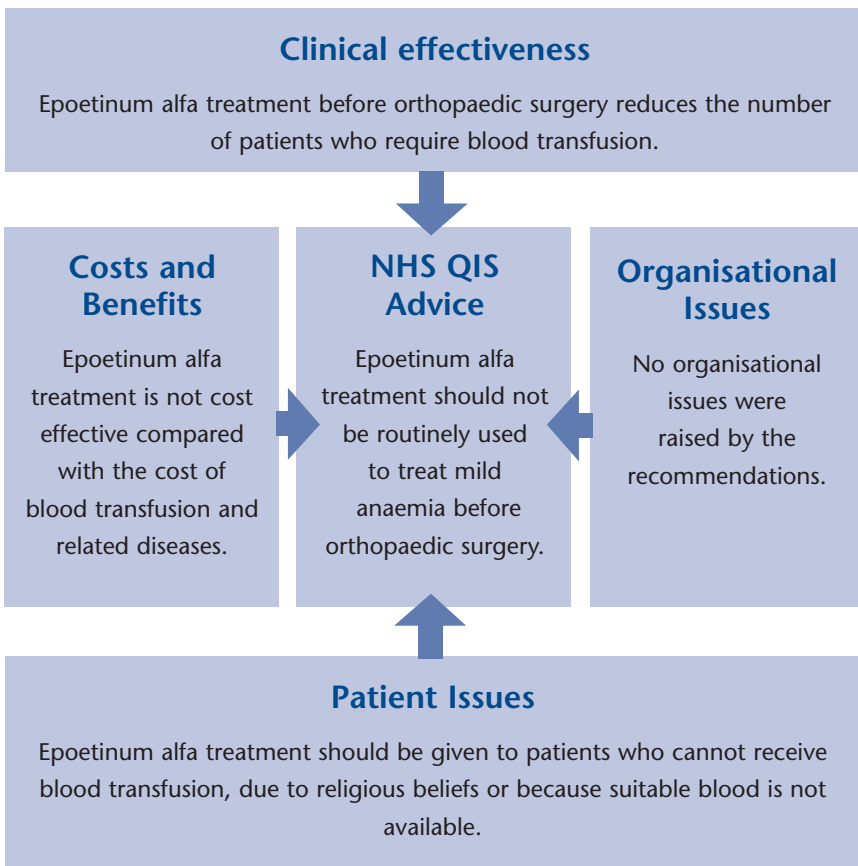
It considered:

- scientific evidence (eg journal articles)
- expertise of healthcare professionals
- needs and preferences of people concerned about the use of donated blood
- the way NHSScotland is organised and how patients are managed now.

We spoke to doctors, surgeons, **anaesthetists**, **haematologists**, the Scottish National Blood Transfusion Service and patients.

The evidence was recorded in a consultation report that we published. Comments received during consultation were published on the web and taken account of in our scientific document, the Health Technology Assessment report.

The following diagram illustrates how the evidence came together to form our advice.



Evidence used

We use the word 'evidence' to include information collected from various sources, and we use different types of evidence to answer different types of question. For example:

- Clinical effectiveness

How effective is epoetinum alfa treatment at reducing the number of patients undergoing orthopaedic surgery who need blood transfusion?

Evidence came from healthcare professionals and studies we reviewed on the use of epoetinum alfa in patients with mild anaemia who require surgery.

- Costs and benefits

What is the cost of treating mildly anaemic patients, before planned orthopaedic surgery, using epoetinum alfa?

What are the health benefits from using epoetin alfa?

Evidence came from healthcare professionals, studies we reviewed on costs and savings, information about **clinical effectiveness** and journal articles.

- Patient issues

What are the concerns of patients with anaemia who require orthopaedic surgery that has a risk of blood loss?

Evidence came from representatives of the Jehovah's Witnesses.



Sources of support and information

The NHS QIS scientific report Health Technology Assessment 8: The use of epoetin alfa before orthopaedic surgery in patients with mild anaemia is available from NHS QIS or its website, www.nhshealthquality.org

Glossary

Anaesthetist	A doctor who administers an anaesthetic to make a patient unconscious before surgery.
Clinical effectiveness	The evaluation of benefit against risk in a standard setting using outcomes of importance to the patient.
Cost effectiveness analysis	A comparison of the cost and health benefits of one health intervention and to standard care.
Haematologist	A doctor who specialises in blood.
Health technology	An intervention used to promote health; prevent, diagnose or treat disease; or provide rehabilitation or long-term care. This includes medicines, devices, clinical procedures and healthcare settings.
Mildly anaemic	Haemoglobin level of 10-13 g/dL
NHSScotland	The National Health Service in Scotland.

NHS Quality Improvement Scotland

Our role is to improve the quality of healthcare in Scotland. We provide clear, authoritative advice on effective clinical practice, set national standards and monitor and publish reports on performance. We also advise on health interventions that are value for money, commission clinical guidelines and support the implementation of clinical governance. To advise on value for money, we must balance how well a treatment works with how much it costs.

Feedback

Understanding our advice aims to explain the work of NHS QIS in a way that everyone can understand. We would warmly welcome feedback on this booklet. For example, have we clearly explained our advice on the use of epoetinum alfa in patients with planned orthopaedic surgery and do you have any questions about our advice that were not answered here? Please send feedback to Jennifer Graham, Project Officer, NHS Quality Improvement Scotland, Delta House, 50 West Nile St, Glasgow G1 2NP, tel. 0141 22 6986, email: Jennifer.graham@nhshealthquality.org

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