NHS
National Institute for Health and Clinical Excellence

Quick reference guide

Issue date: February 2011

Anaemia management in people with chronic kidney disease

This updates and replaces NICE clinical guideline 39

NICE clinical guideline 114
Developed by the National Clinical Guideline Centre

About this booklet

This is a quick reference guide that summarises the recommendations NICE has made to the NHS in 'Anaemia management in people with chronic kidney disease' (NICE clinical guideline 114).

This guidance updates and replaces NICE clinical guideline 39 (published September 2006). This booklet includes the recommendations developed in 2006, and the new recommendations for the 2011 update. New recommendations have been added for the diagnostic evaluation and assessment and optimisation of erythropoiesis.

Who should read this booklet?

This quick reference guide is for doctors, nurses and other staff who care for people with anaemia and chronic kidney disease.

Who wrote the guideline?

The guideline was developed by the National Clinical Guideline Centre. The Collaborating Centre worked with a group of healthcare professionals (including consultants, GPs and nurses), patients and carers, and technical staff, who reviewed the evidence and drafted the recommendations. The recommendations were finalised after public consultation.

For more information on how NICE clinical guidelines are developed, go to **www.nice.org.uk**

Where can I get more information about the guideline?

The NICE website has the recommendations in full, reviews of the evidence they are based on, a summary of the guideline for patients and carers, and tools to support implementation (see back cover for more details).

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NICE clinical guidelines are recommendations about the treatment and care of people with specific diseases and conditions in the NHS in England and Wales.

This guidance represents the view of NICE, which was arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer, and informed by the summary of product characteristics of any drugs they are considering.

Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.

Contents

Introduction

Anaemia in people with chronic kidney disease (CKD) can lead to reduced oxygen utilisation, increased cardiac output and left ventricular hypertrophy, and is associated with increased progression of CKD. This may impact on quality of life, increase hospitalisation, increase cardiovascular events and increase cardiovascular and all-cause mortality.

Since the introduction of human recombinant erythropoietin for treating CKD-related anaemia, attention has shifted from treating severe anaemia in people receiving dialysis to preventing anaemia at an earlier stage. More recently, debate has focused on the optimum haemoglobin (Hb) range when treating anaemia of CKD.

Patient-centred care

Treatment and care should take into account patients' individual needs and preferences. Good communication is essential, supported by evidence-based information, to allow patients to reach informed decisions about their care. Follow advice on seeking consent from the Department of Health or Welsh Assembly Government if needed. If the patient agrees, families and carers should have the opportunity to be involved in decisions about treatment and care. If caring for young people in transition between paediatric and adult services refer to 'Transition: getting it right for young people' (available from **www.dh.gov.uk**).

Key priorities for implementation

When to begin treating the anaemia

- Consider investigating and managing anaemia in people with CKD if:
  - their Hb level falls to 11 g/dl or less (or 10.5 g/dl or less if younger than 2 years) **or**
  - they develop symptoms attributable to anaemia (such as tiredness, shortness of breath, lethargy and palpitations). ***[new 2011]***

Who should receive ESAs

- Treatment with erythropoiesis-stimulating agents (ESAs) should be offered to people with anaemia of CKD who are likely to benefit in terms of quality of life and physical function.

Agreeing a plan for ESA treatment

- ESA treatment should be clinically effective, consistent and safe in people with anaemia of CKD. To achieve this, the prescriber and patient should agree a plan that is patient-centred and includes:
  - continuity of drug supply
  - flexibility of where the drug is delivered and administered
  - the lifestyle and preferences of the patient
  - cost of drug supply
  - desire for self-care where appropriate
  - regular review of the plan in light of changing needs.

Aspirational range and action thresholds for Hb

- When determining individual aspirational Hb ranges for people with anaemia of CKD, take into account:
  - patient preferences
  - symptoms and comorbidities
  - the required treatment. ***[new 2011]***
- The correction to normal levels of Hb with ESAs is not usually recommended in people with anaemia of CKD:
  - Typically maintain the aspirational Hb range between 10 and 12 g/dl for adults, young people and children aged 2 years and older, and between 9.5 and 11.5 g/dl for children younger than 2 years of age, reflecting the lower normal range in that age group.
  - To keep the Hb level within the aspirational range, do not wait until Hb levels are outside the aspirational range before adjusting treatment (for example, take action when Hb levels are within 0.5 g/dl of the range's limits). ***[new 2011]***

Age

- Age alone should not be a determinant for treatment of anaemia of CKD.

continued

Iron supplementation: aspirational ranges

- People receiving ESA maintenance therapy should be given iron supplements to keep their:
  - serum ferritin levels between 200 and 500 µg/l in both haemodialysis and non-haemodialysis patients, **and either**
    - transferrin saturation level above 20% (unless ferritin is greater than 800 µg/l) **or**
    - percentage hypochromic red cells (%HRC) less than 6% (unless ferritin is greater than 800 µg/l).

In practice it is likely this will require intravenous iron.

Key to terms

eGFR Estimated glomerular filtration rate

Hb Haemoglobin

%HRC Percentage hypochromic red cells

Stage 1 CKD (GFR > 90 ml/min/1.73m²) Normal or increased GFR, with other evidence of kidney damage

Stage 2 CKD (GFR 60–89 ml/min/1.73m²) Slight decrease in GFR, with other evidence of kidney damage

Stage 3 CKD (GFR 30–59 ml/min/1.73m²) Moderate decrease in GFR, with or without other evidence of kidney damage. Stage 3a is GFR 45–59 ml/min/1.73m² and stage 3b is GFR 30–44 ml/min/1.73m²

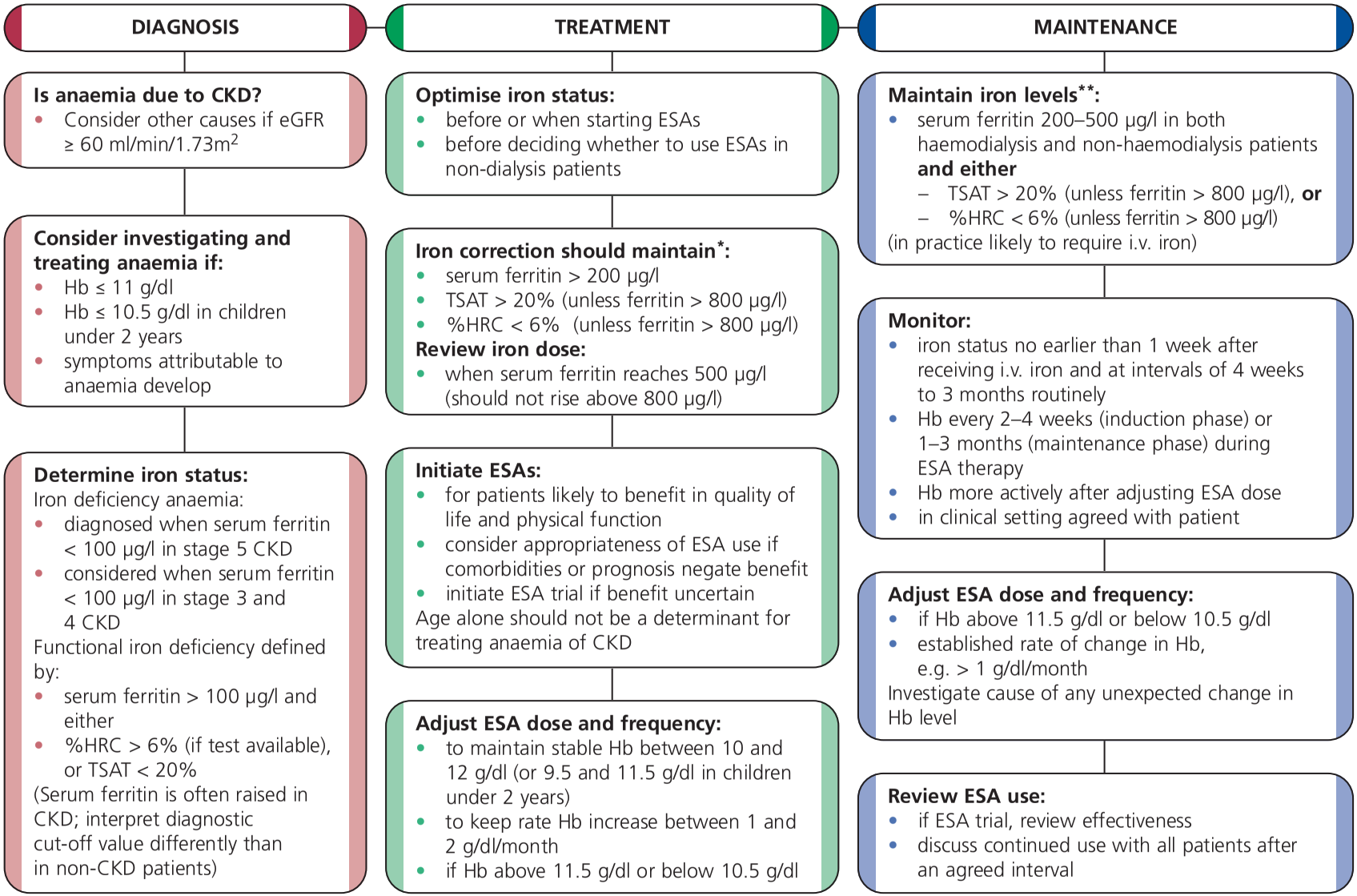
Stage 4 CKD (GFR 15–29 ml/min/1.73m²) Severe decrease in GFR, with or without other evidence of kidney damage

Stage 5 CKD (GFR < 15 ml/min/1.73m²) Established renal failure

TSAT Transferrin saturation

Overview of the management of anaemia of CKD

The overview on page 6 provides an outline of the key stages of managing anaemia of CKD. It does not cover all of the recommendations in the NICE guideline, and additional information is summarised in subsequent sections.



Iron doses

*Correction: usually 600–1000 mg iron for adults or equivalent doses for children (single or divided dose depending on the preparation). Treat patients with functional iron deficiency with i.v. iron. Peritoneal dialysis and non-dialysis patients who do not respond to oral iron will require i.v. iron. In appropriate circumstances, iron treatment can also be administered in the community.

**Maintenance: dosing regimen will depend on modality, for example haemodialysis patients will require the equivalent of 50–60 mg i.v. iron per week (or an equivalent dose in children of 1 mg/kg/week). Peritoneal dialysis and non-dialysis patients who do not respond to oral iron will require i.v. iron.

Patient education and providing care

Patient education programmes

- Offer all people diagnosed with anaemia of CKD (and their families and carers) culturally and age-appropriate patient education programmes. These should be repeated as requested and according to the patient's changing circumstances. The programmes should include:
  - practical information about how anaemia of CKD is managed
  - knowledge (for example, about symptoms, iron management, causes of anaemia, associated medications, phases of treatment)
  - professional support (for example, contact information, community services, continuity of care, monitoring, feedback on progress of results)
  - lifestyle (for example, diet, physical exercise, maintaining normality, meeting other patients)
  - adaptation to chronic disease (for example, previous information and expectations, resolution of symptoms).

Patient-centred care

- Give people offered ESA therapy and their GPs information about why it is required, how it works and the potential benefits and side effects.
- When managing the treatment of people with anaemia of CKD, there should be agreed protocols defining roles and responsibilities of healthcare professionals in primary and secondary care.
- Inform people receiving ESA therapy about the importance of concordance with therapy and the consequences of poor concordance.
- When prescribing ESA therapy, take into account patient preferences about:
  - supervised or self-administration, dose frequency and pain on injection
  - method of supplying the ESA and its storage.
- In order for people to safely and effectively self-administer their ESA, make arrangements to provide ready, reasonable and uninterrupted access to supplies.

Coordinating care

- People with anaemia of CKD should have access to a designated contact person or persons who have principal responsibility for managing the anaemia. They should have skills in:
  - monitoring and managing a caseload of patients in line with locally agreed protocols
  - providing information, education and support to empower patients and their families and carers to participate in their care
  - coordinating an anaemia service for people with CKD, working between secondary and primary care and providing a single point of contact, to ensure patients receive a seamless service of the highest standard
  - prescribing medicines related to managing anaemia and monitoring their effectiveness.

Providing ESAs

- The prescriber and patient should agree a patient-centred plan that includes:
  - continuity and cost of drug supply
  - flexibility of where the drug is delivered and administered
  - the patient's lifestyle and preferences, including the desire for self-care where appropriate
  - regular review of the plan in light of the patient's changing needs.

Managing anaemia of CKD

Initiating ESA therapy

See also the management overview on page 6.

Iron-deficient patients

- In patients with iron deficiency, do not initiate ESAs without also managing the iron deficiency.

Clinical utility of ESA therapy in iron-replete patients

- Discuss the pros and cons of anaemia management with the patient, and their family and carers if applicable.
- ESAs need not be administered if the presence of comorbidities or the prognosis is likely to negate the benefit of correcting the anaemia.
- Initiate a trial of anaemia correction if it is uncertain whether presence of comorbidities, or the prognosis, would negate the benefit of correcting the anaemia using ESAs.
- Where a trial of an ESA is performed, assess its effectiveness after an agreed interval. Where appropriate the clinician, patient and their family and carers should agree whether or not to continue using ESAs.
- Review all patients started on ESAs after an agreed interval, to decide whether or not to continue ESA therapy.

Hyperparathyroidism

- Treat clinically relevant hyperparathyroidism to improve anaemia management in patients with anaemia of CKD.

Choice of ESA

- Discuss the choice of ESA with the patient when initiating treatment and at subsequent review. Consider the:
  - patient's dialysis status
  - route of administration
  - local availability of ESAs.

There is no evidence to distinguish between ESAs in terms of efficacy.

Optimal administration route

- Agree (and revise as appropriate) the administration route of ESAs with the patient, taking into account:
  - patient population (for example, haemodialysis patients)
  - pain of injection
  - frequency of administration
  - the patient's lifestyle and preferences
  - efficacy (for example, subcutaneous versus intravenous administration, or long-acting versus short-acting preparations)
  - cost of drug supply.
- When using short-acting ESAs, take into account that subcutaneous injection allows lower doses of drugs to be used than intravenous administration.

Dose and frequency of ESAs

- When correcting anaemia of CKD:
  - determine the dose and frequency of the ESA by the duration of action and administration route
  - adjust the dose and frequency of the ESA to keep the rate of Hb increase between 1 and 2 g/dl/month.

Optimising Hb levels

See also the management overview on page 6.

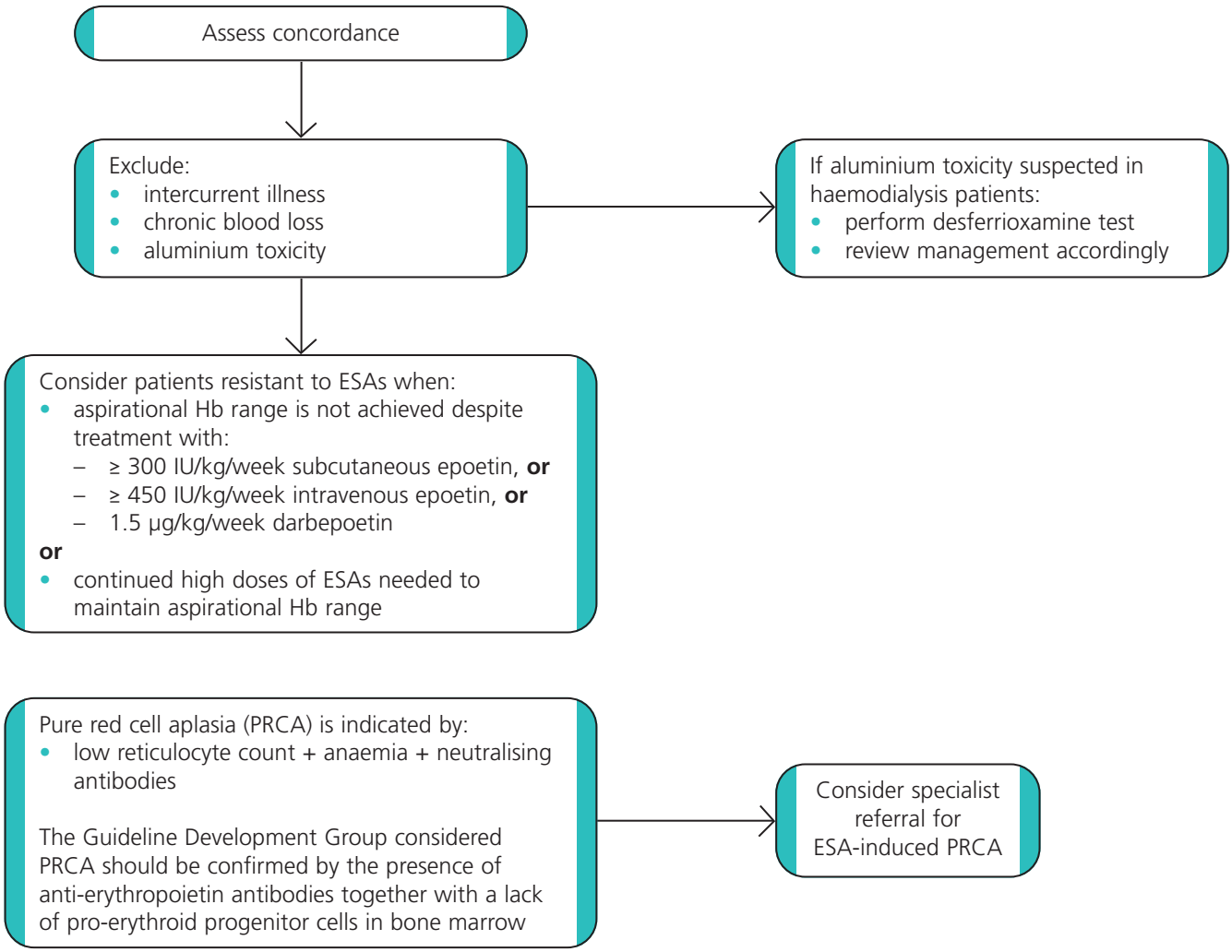
- Correcting Hb to normal levels is not usually recommended.
- When determining individual aspirational Hb ranges, take into account patient preferences, symptoms and comorbidities, and the required treatment.
- Typically maintain the aspirational Hb range 10–12 g/dl for adults, young people and children aged 2 years and older (9.5–11.5 g/dl for children younger than 2 years). To achieve this, do not wait until Hb levels are outside the aspirational range before adjusting treatment.
- Consider accepting lower Hb levels if:
  - high doses[1] of ESAs are required to achieve the aspirational range **or**
  - the aspirational range is not achieved despite escalating ESA doses.
- Consider accepting Hb levels above the agreed aspirational range when:
  - these develop with iron therapy alone **or**
  - these develop with low doses of ESAs **or**
  - it is thought that the person might benefit (for example, if they have a physically demanding job) **or**
  - the absolute risk of cerebrovascular disease is thought to be low.

[1] > 175 IU/kg/week for haemodialysis population; > 125 IU/kg/week for peritoneal dialysis population; > 100 IU/kg/week for non-dialysis population (Data provided by the National Renal Registry and GDG expert opinion).

Adjusting ESAs

- Take into account Hb measurements when determining the dose and frequency of ESA administration.
- Investigate the cause of an unexpected change in Hb level (that is, intercurrent illness, bleeding) to enable intervention and optimise iron status.
- Adjust dose or frequency of ESA if Hb levels fall outside action thresholds (usually below 10.5 g/dl or above 11.5 g/dl), or if the rate of change of Hb suggests an established trend (for example, greater than 1 g/dl/month).
- Use of angiotensin-converting enzyme (ACE) inhibitors or angiotensin type II receptor antagonists is not precluded, but consider increasing ESA therapy if they are used.

Detecting and managing ESA resistance



Tests and treatments that should not be used

Erythropoietin levels

- Do not routinely consider measuring erythropoietin levels for diagnosing or managing anaemia of CKD.

Nutritional supplements

- Do not prescribe supplements of vitamin C, folic acid or carnitine as adjuvants specifically for treating anaemia of CKD.

Androgens

- Do not use androgens to treat anaemia of CKD.

Blood transfusions

- Where possible, avoid blood transfusions in patients in whom kidney transplant is a treatment option.
- In situations where a transfusion is indicated clinically, follow the relevant haematology guidelines[2].

[2] Chapman JF, Elliott C, Knowles SM et al. (2004) Guidelines for compatibility procedures in blood transfusion laboratories. Transfusion Medicine 14: 59–73

Further information

Ordering information

You can download the following documents from **www.nice.org.uk/guidance/CG114**

- The NICE guideline – all the recommendations.
- A quick reference guide (this document) – a summary of the recommendations for healthcare professionals.
- 'Understanding NICE guidance' – a summary for patients and carers.
- The full guideline – all the recommendations, details of how they were developed, and reviews of the evidence they were based on.

For printed copies of the quick reference guide or 'Understanding NICE guidance', phone NICE publications on 0845 003 7783 or email publications@nice.org.uk and quote:

- N2427 (quick reference guide)
- N2428 ('Understanding NICE guidance').

Implementation tools

NICE has developed tools to help organisations implement this guidance (see **www.nice.org.uk/guidance/CG114**).

Related NICE guidance

For information about NICE guidance that has been issued or is in development, see **www.nice.org.uk**

Published

- Chronic kidney disease. NICE clinical guideline 73 (2008). Available from **www.nice.org.uk/guidance/CG73**
- Anaemia (cancer-treatment induced) – erythropoietin (alpha and beta) and darbepoetin. NICE technology appraisal guidance 142 (2008). Available from **www.nice.org.uk/guidance/TA142**

Updating the guideline

This guideline will be updated as needed, and information about the progress of any update will be available at **www.nice.org.uk/guidance/CG114**

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