Does the patient need a blood transfusion?
- Yes
- No

Is the patient having surgery?
- Yes
- No

Consider other alternatives for blood transfusion
For example, treatment of any underlying cause for anaemia, such as iron deficiency.

Identify appropriate blood component/product to be transfused
- For guidance on managing bleeding for people with acute upper gastrointestinal bleeding, see section 3.2 in the NICE guideline on acute upper gastrointestinal bleeding.

Give appropriate verbal and written information to the patient and/or carer
- Provide verbal and written information to patients who may have or who have had a transfusion, and their family members or carers (as appropriate), explaining:
  - the reason for the transfusion
  - the risks and benefits
  - the transfusion process
  - any transfusion needs specific to them
  - any alternatives that are available, and how they might reduce their need for a transfusion
  - that they are no longer eligible to donate blood
  - that they are encouraged to ask questions.
- Document discussions in the patient’s notes.
- Provide the patient and their carer with copies of the discharge summary or other written communication that explains:
  - the details of any transfusions they had
  - the reasons for the transfusion
  - any adverse events
  - that they are no longer eligible to donate blood.

Transfuse the patient following the appropriate recommendations for each component (see below)
- Consider using a system that electronically identifies patients to improve the safety and efficiency of the blood transfusion process.

Red blood cells recommendations
- Use restrictive red blood cell transfusion thresholds for patients who need regular red blood transfusions for chronic anaemia.
- When using a restrictive red blood cell transfusion threshold, consider a threshold of 70 g/litre and a haemoglobin concentration target of 70-90 g/litre after transfusion.
- Consider a red blood cell transfusion threshold of 80 g/litre and a haemoglobin concentration target of 80-100 g/litre after transfusion for patients with acute coronary syndrome.
- Consider setting individual thresholds and haemoglobin concentration targets for each patient who needs regular blood transfusions for chronic anaemia.

Platelets recommendations
- Offer platelet transfusions to patients with thrombocytopenia who have clinically significant bleeding (World Health Organization (WHO) grade 2) and a platelet count below 20-50 x 10^-9 per litre.
- Use a time ratio platelet threshold (up to a maximum of 100 x 10^-9 per litre) for patients with thrombocytopenia and either of the following:
  - bleeding in critical sites (such as the central nervous system (including head injury)), a fibrinogen level below 0.5 g/litre in patients who are having invasive procedures or surgery.
  - Consider prophylactic platelet transfusions to patients with a platelet count above 10-50 x 10^-9 per litre who are not bleeding or having invasive procedures or surgery.
- Consider a higher threshold (for example 50-70 x 10^-9 per litre) for patients with a high risk of bleeding who are having invasive procedures or surgery.
- Consider prophylactic platelet transfusions to raise the platelet count above 100-200 x 10^-9 per litre in patients having surgery in critical sites, such as the central nervous system (including head injury) and/or a fibrinogen level below 0.5 g/litre in patients who are having invasive procedures or surgery.
- Do not routinely offer prophylactic platelet transfusions to patients with any of the following:
  - chronic bone marrow failure
  - autosomal thrombocytopenia
  - heparin-induced thrombocytopenia
  - thrombotic thrombocytopenic purpura
  - Do not offer prophylactic platelet transfusions to patients having procedures with a low risk of bleeding, such as adults having central venous cannulation or any patients having bone marrow aspiration and trephine biopsy.
- Do not routinely transfuse more than a single dose of platelets.
- Only consider giving more than a single dose of platelets in a transfusion for patients with severe thrombocytopenia and bleeding in a critical site, such as the central nervous system (including head injury).
- Reassess the patient’s clinical condition and check their platelet count after each platelet transfusion, and give further doses if needed.

Fresh frozen plasma recommendations
- Only consider fresh frozen plasma transfusions for patients with clinically significant bleeding after major haemorrhage if they have abnormal coagulation test results (for example, prothrombin time ratio or activated partial thromboplastin time ratio above 1.5).
- Do not offer fresh frozen plasma transfusions to correct abnormal coagulation test results in patients who are not bleeding (unless they are having invasive procedures or surgery with a risk of clinically significant bleeding).
- Do not offer fresh frozen plasma transfusions to patients with abnormal coagulation who are having invasive procedures or surgery with a risk of clinically significant bleeding.
- Consider prophylactic fresh frozen plasma transfusions for patients with abnormal coagulation who are having invasive procedures or surgery with a risk of clinically significant bleeding.
- Consider prophylactic fresh frozen plasma transfusions for patients with abnormal coagulation who are having invasive procedures or surgery with a risk of clinically significant bleeding.
- Consider the patient’s clinical condition and repeat the coagulation tests after fresh frozen plasma transfusion to ensure that they are getting an adequate dose, and give further doses if needed.

Cryoprecipitate recommendations
- Consider cryoprecipitate transfusions for patients with major haemorrhage who have:
  - clinically significant bleeding
  - a fibrinogen level below 1.5 g/litre.
- Do not offer cryoprecipitate transfusions to correct the fibrinogen level in patients who:
  - are not bleeding
  - are not having invasive procedures or surgery with a risk of clinically significant bleeding.
- Consider cryoprecipitate transfusions for patients with a fibrinogen level below 2.0 g/litre who are having invasive procedures or surgery with a risk of clinically significant bleeding.
- Consider cryoprecipitate transfusions for patients with a fibrinogen level below 4.0 g/litre who are having invasive procedures or surgery with a risk of clinically significant bleeding.
- Consider cryoprecipitate transfusions for patients with a fibrinogen level below 6.0 g/litre who are having invasive procedures or surgery with a risk of clinically significant bleeding.
- Consider cryoprecipitate transfusions for patients with a fibrinogen level below 8.0 g/litre who are having invasive procedures or surgery with a risk of clinically significant bleeding.
- Consider cryoprecipitate transfusions for patients with a fibrinogen level below 10.0 g/litre who are having invasive procedures or surgery with a risk of clinically significant bleeding.
- Consider cryoprecipitate transfusions for patients with a fibrinogen level below 12.0 g/litre who are having invasive procedures or surgery with a risk of clinically significant bleeding.
- Consider cryoprecipitate transfusions for patients with a fibrinogen level below 14.0 g/litre who are having invasive procedures or surgery with a risk of clinically significant bleeding.
- Consider cryoprecipitate transfusions for patients with a fibrinogen level below 16.0 g/litre who are having invasive procedures or surgery with a risk of clinically significant bleeding.
- Consider cryoprecipitate transfusions for patients with a fibrinogen level below 18.0 g/litre who are having invasive procedures or surgery with a risk of clinically significant bleeding.

Prothrombin complex concentrate recommendations
- Offer immediate prothrombin complex concentrate transfusions for the emergency reversal of warfarin anticoagulation in patients with either:
  - severe bleeding
  - head injury with suspected intracranial haemorrhage.
- For guidance on reversing anticoagulation treatment in people who have a stroke and a prior history of haemorrhage, see recommendations 1.3.2.1. and 1.4.2.1 in the NICE guideline on the initial diagnosis and management of stroke.
- Consider immediate prothrombin complex concentrate transfusions to reverse warfarin anticoagulation in patients having emergency surgery, depending on the level of anticoagulation and the bleeding risk.
- Monitor the international normalised ratio (INR) to confirm that warfarin anticoagulation has been adequately reversed, and consider further prothrombin complex concentrate.

Consider alternative therapies for blood transfusion as follows:
- Do not offer erythropoietin to reduce the need for blood transfusions in patients having surgery, unless:
  - the patient has anaemia and meets the criteria for blood transfusion, but declines it because of religious beliefs, other reasons or the appropriate blood type is not available because of the patient’s red cell antibodies.
- Offer iron before and after surgery to patients with iron-deficiency anaemia.
- Consider intravenous iron before or after surgery for patients who:
  - have iron-deficiency anaemia and cannot tolerate or absorb iron, or
  - are unable to adhere to oral iron treatment (see the NICE guideline on medicines adherence).
- Do not offer intravenous iron for patients with functional iron deficiency.
- Are diagnosed with iron-deficiency anaemia, and the interval between the diagnosis of anaemia and surgery is predicted to be too short for oral iron to be effective.
- For guidance on managing anaemia in patients with chronic kidney disease, see the NICE guideline on anaemia management in chronic kidney disease.
- Offer tranexamic acid to adults undergoing surgery who are expected to have at least moderate blood loss (greater than 500 ml).
- Consider tranexamic acid for children undergoing surgery who are expected to lose a very high volume of blood (for example in cardiac and complex vascular surgery, major obstetric procedures, and pelvic reconstruction and urological surgery).
- Does the patient still need a blood transfusion?
- Yes

Monitor the patient’s condition and vital signs before, during and after blood transfusions, to detect acute transfusion reactions that may need immediate investigation and treatment.
- Observe patients who are having or have had a blood transfusion in a suitable environment with staff who are able to monitor and manage acute reactions.

For further information, see the NICE guideline on the initial diagnosis and management of stroke.