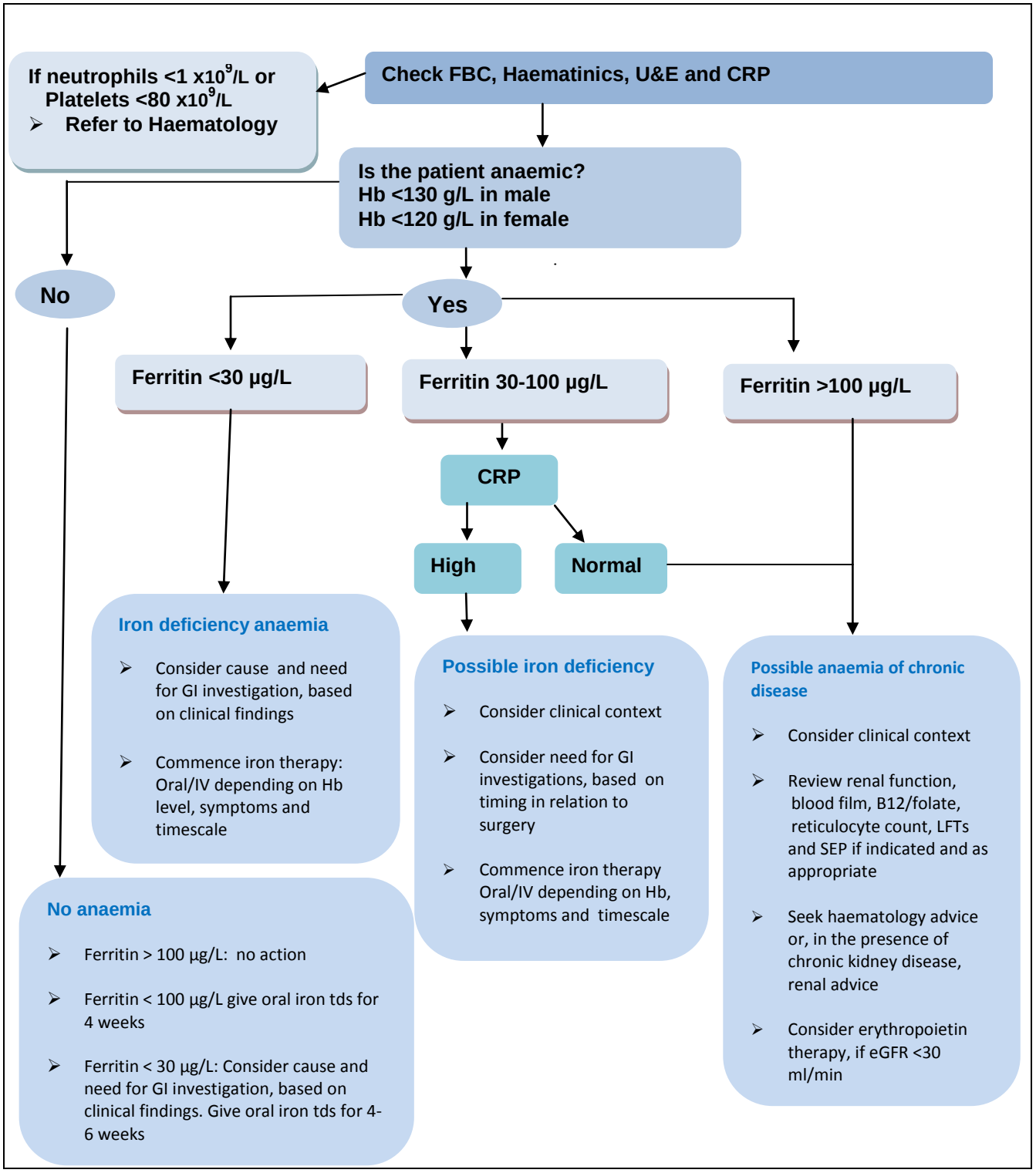
The Pennine Acute Hospitals NHS Trust

Quick Reference Sheet for Guideline –
Patient Blood Management prior to Surgery
CPDI 063, v5.1

Pathway for investigation of anaemia (Flowchart 1)



The Pennine Acute Hospitals NHS Trust

Guideline –

Patient Blood Management prior to Surgery

This guidance clearly sets out the appropriate actions required for the investigation and management of patients requiring surgery that are at risk of anaemia and/or bleeding, in order to minimise their need for a blood component transfusion.

All surgeons and GPs should familiarise themselves with the content of this guidance document and begin to implement the actions.

Key words: Surgery, Anaemia, Blood, Iron, Ferritin, Cosmofer, Monofer

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Pennine Acute Hospitals NHS Trust

Guideline – Patient Blood Management prior to Surgery

Main Revisions from previous issue	
Name of Previous Document:	Guidelines – Patient Blood Management prior to Surgery
Document Number:	CPDI 063
Version Number:	5.0
Reason for Revision:	Asthma is no longer contraindicated for the administration of IV Iron (Monofer & Cosmofer) - Removal of word 'Asthma' from page 9

Contents

1. Introduction

1.1 Patient Blood Management is a multidisciplinary, evidence-based approach to optimising the care of patients in order to avoid or minimise the need for allogeneic transfusion.

1.2 Anaemic patients are at increased risk of transfusion, mortality and major morbidity, in proportion to the severity of anaemia. Even mild anaemia increases relative mortality risk by a third.

1.3 Pre-operative anaemia is common and prevalence varies from 5-75% depending on the population studied and the surgical procedure. Transfusion increases the risk of peri-operative mortality and major morbidity in a dose-dependent fashion.

1.4 Pre-operative anaemia substantially increases health care costs with significant additional cost incurred out of hospital. It further predisposes patients to requiring allogeneic blood transfusion, thereby increasing the burden on blood donors and donor services.

1.5 The World Health Organization (WHO) has defined anaemia as
Hb < 130 g/L for men
Hb < 120 g/L for women

1.6 This document should be read in conjunction with the following trust policies

- Education Training & Development 'Induction & Mandatory Training Policy, EDH 024
- Accident and Incident reporting policy, EDQ 008
- Medicines Policy, EDC 018
- Policy on Consent to Examination or Treatment, EDQ 002
- Guideline for the management of patients receiving antithrombotic drugs CPD1201

These policies are available via Trust Document Management System (DMS).

2. Aims

2.1 To identify and optimise all patients with anaemia prior to surgery to minimise the risk of requiring an allogeneic transfusion.

2.2 To provide health care professionals with clear and simple recommendations for the management of anaemia prior to surgery.

2.3 To reduce blood usage in adult elective surgery.

3. Scope

This guideline is for all clinical staff involved in the care of patients prior to surgery and to facilitate safe and appropriate treatment of anaemia where necessary.

4. Roles, Responsibilities and Accountabilities

4.1 **The Division of Diagnostics Quality and Performance Committee** is responsible for authorising

the document and receiving assurance of compliance through review of documentation provided by the Trust Transfusion Committee

4.2 **The Trust Transfusion Committee (TTC)** is the sponsor group for this document. They are responsible for promoting the safe care of patients who require treatment for anaemia, through local policy, based on national guidelines. The TTC will ensure compliance with this document by review of adverse incident reports. The TTC will also provide reports to the Division of Diagnostics Quality and Performance Committee

4.3 **The Hospital Transfusion Team (HTT)** is responsible for review of national guidelines and local adverse incidents making recommendations to the TTC

4.4 **The Transfusion Practitioner Team** is responsible for review of any individual incidents of non-compliance, report externally to SHOT and MHRA when required and feed in to the HTT. The transfusion practitioner team provide training on the application of this document.

4.5 **Ward and departmental managers** are responsible for dissemination of this document and ensuring compliance of all staff within their sphere of responsibility.

4.6 **All Staff** are required to comply with this document and to bring to the attention of their immediate manager any difficulties they encounter in using this document. Report any adverse incidents via the Trust Accident & Incident Reporting Policy (EDQ 008).

5. Guidance for Patient Blood Management in Patients prior to Surgery

5.1 <u>Pre-operative assessment:</u> performed by GPs or referring physicians or Pre-Operative Assessment Clinics (POACs)

- The investigation and management of pre-operative anaemia should ideally be a collaborative process involving primary and secondary care.

- To avoid disruption to surgical schedules, anaemia screening should take place as early as possible in the referral pathway, ideally when referral is first made. Wherever possible, this should take place with sufficient time to allow investigation and correction if appropriate.

- Where surgery is urgent, whatever time is available before the operation should still be used for anaemia investigation and treatment initiation.

- Anaemia may be expected as part of the presenting complaint. However, surgery represents a ‘sentinel event’ for many patients and work-up may reveal previously unsuspected disease.

  Anaemic patients will therefore fall into two groups:
  - Those who may safely proceed to surgery with anaemia treatment.
  - Those who require investigation may require a delay of surgery whilst more extensive investigation is carried out, to exclude previously undetected disease.

- The pre-operative assessment should include:
  - Identification, investigation and management of patients with or at risk of anaemia.

- Assessment of the adequacy of iron stores in patients undergoing planned procedures in which substantial blood loss is anticipated.
- Awareness and assessment of medications and complementary medicines that might increase bleeding risk.
- Awareness of and ability to discuss with patients, the possible risks associated with blood transfusion and to give information on the possibility of requiring when appropriate cell salvage, intra or post-operatively (See Appendix 3).

- All patients who are identified as at risk of requiring a blood transfusion should have **FBC, haematinics, CRP, U&Es and clotting screen (INR, APTT and Fibrinogen).** (Serum Ferritin is an acute phase protein and may be raised if CRP is elevated).

- All blood results should be reviewed within 2 working days. Abnormal results should be discussed with a member of the clinical team who has sufficient authority to commence treatment, refer for further investigation or delay surgery as necessary.

- Determine possible cause of anaemia based on history, examination and laboratory results (see appendix 4 for flowchart). Seek specialist advice as appropriate. For example seek Haematology advice if concomitant low platelet and white cell counts, Gastroenterology advice in GI bleeding, Nephrology advice in the presence of chronic kidney disease (eGFR<30 ml/min).

- For anaemic patients requiring treatment, a clear and timely approach should be available without undue disruption to existing patient pathway.

- Inherited haemoglobin disorders (haemoglobinopathies) should be considered in all individuals with microcytic anaemia if there is no evidence of iron deficiency, or if red cell changes persist after adequate iron replacement. Send an EDTA blood sample for HPLC testing.

- All patients who are taking anticoagulant drugs such warfarin, aspirin, or other anti-platelet agents (e.g. dipyridamole or Clopidogrel), Non Steroidal Anti-Inflammatory Drugs (NSAIDS) and novel oral anticoagulants (Dabigatran, Apixaban, Rivaroxaban) should be identified and necessary arrangements made to stop the drug at a suitable interval preoperatively (see Guideline for the management of patients receiving antithrombotic drugs CPDI 201). Patients on such drugs should have a clear, written guidance on when to stop and restart these medications prior to surgery. Peri-operative plans should be provided to the patient and clearly recorded in the medical notes for admitting teams.

Table 1: Outlines the questions to consider when referring a patient for elective surgery

Questions to consider when referring a patient for elective surgery

- Is the surgery likely to result in significant blood loss?
- Does my patient have anaemia or are they at risk of anaemia?
- What are my patient's iron stores?
- Are there co-morbidities that may contribute to adverse outcomes if anaemia develops? If so, what steps are needed to optimise these conditions (e.g. cardiac disease)?
- Are there chronic conditions that may impede a haematopoietic response to anaemia (e.g. chronic kidney disease, inflammation or bone marrow pathology)?
- What medications is my patient taking that might increase their bleeding risk?
- Is my patient informed about the possible risks associated with blood transfusion and alternatives that may be available?

Table 2: Outlines the risks and adverse outcomes associated with blood transfusion that the referring physician should be aware of and discuss with the patient (Printed patient leaflets are available to download from www.blood.co.uk, see appendices 1 and 2)

Risks and adverse outcomes associated with blood transfusion

Non-infectious risks

- Acute haemolytic reaction (e.g. incorrect blood component transfused)
- Allergic, including anaphylactic, reactions
- Transfusion associated circulatory overload (TACO)
- Transfusion related acute lung injury (TRALI)
- Delayed haemolytic transfusion reaction
- Transfusion associated graft versus host disease

Adverse outcomes – red blood cell transfusion has been associated with

- Increased morbidity and mortality
- Increased ICU and hospital length of stay
- Increased incidence of postoperative infection Transfusion related immunomodulation

Infectious risks

Blood transfusion is safe however there remains a very low risk of transmission of known infectious agents (HIV, hepatitis C and B). It is estimated that, the risk of getting hepatitis B is about 1 in 1.3 million, hepatitis C is about 1 in 28 million and HIV is about 1 in 6.5 million.

- The blood supply will always remain vulnerable to emerging infectious agents, such CJD
- Bacterial contamination is also low risk; however this is still an important consideration, particularly with platelet transfusion.

5.2 Management of anaemia

The management option(s) appropriate for an anaemic patient depend on interplay between the following factors:

- The cause and severity of anaemia
- The anticipated peri-operative blood loss
- The timescale before surgery
- Whether surgery may safely be postponed

- Common causes of anaemia include iron, B12 or folate deficiency, anaemia of chronic disease and chronic kidney disease. Consider blood loss or haemolysis if reticulocyte count is increased.

  Iron Deficiency Anaemia (IDA) can be due to blood loss, impaired iron absorption or failure to utilise iron stores. Potential causes are: Menorrhagia, chronic gastro-intestinal symptoms or chronic bleeding from GI tract, acute or chronic inflammatory bowel disease or malabsorption, malignancy, pregnancy.

Iron Therapy

- Both oral iron tablets and intravenous iron preparations are inexpensive products compared with the transfusion of red cells.
- Oral iron is indicated in iron deficient anaemic patients whose surgery is not urgent. While intravenous iron is indicated in patients intolerant or unresponsive to oral iron or when the timescale for surgery is predicted to be short.
- Iron therapy is indicated for non-anaemic iron deplete patients (ferritin <100ng/L) scheduled to undergo surgery with predicted total peri-operative erythrocyte loss >30g/L, to protect against post-operative IDA.

Oral iron therapy:

- Commonly prescribed Ferrous Sulphate 200 mg TDS or Ferrous Fumarate 325 mg BD-TDS.
- Patients must be advised how to take oral iron effectively. Iron should be taken on an empty stomach with orange juice. Tea, coffee and calcium decrease the absorption of iron and should be avoided an hour either side.
- Oral iron can cause significant gastrointestinal side effects that result in poor compliance. A patient who fails to tolerate one preparation may tolerate another.
- Oral iron should be continued for 3 months after the haemoglobin and iron stores are replenished.

Parenteral (IV iron):

- Intravenous iron should only be used when oral iron is not tolerated or there is a history of malabsorption or active inflammatory bowel disease, or the timescale before surgery is limited to <4 weeks.
- Dosing for intravenous iron is dependent on the patient's haemoglobin, ferritin level and weight.
- Facilities for cardiopulmonary resuscitation and personnel trained to handle anaphylactoid reactions must be available.
- Intravenous iron is contradicted in patients with a history of allergic eczema or other atopic allergy.

Table 3 Outlines the dosage of Intravenous Iron

Dose IV iron recommended:

Hb >80 g/L give intravenous iron 500 mg
Hb < 80 g/L give intravenous iron 1000 mg

Intravenous iron products available in the trust:

Monofer ® 500 mg in 100 ml of sodium chloride (0.9%) over 10 min
Monofer ® 1000 mg in 250 ml of sodium chloride (0.9%) over 30 min, max dose 20 mg/kg

Cosmofer ® 500 mg in 500 ml of sodium chloride (0.9%) over 3-4 hours
Cosmofer ® 1000 mg in 500 ml of sodium chloride (0.9%) over 3-4 hours, max dose 20 mg/kg

NB: No test dose is required with IV iron but patients must be observed for 30 minutes post infusion.

B12 and Folate therapy

- **For B12 deficiency**: Give Hydroxycobalamin by intramuscular injection1 mg 3 times a week first week (Monday-Wednesday - Friday) and 2 times a week second week (total of 5 injections).
- **For Folate deficiency**: Give Folic Acid orally 5 mg OD for 4 weeks.

Erythrocytosis-stimulating agent (ESA) therapy

- In Anaemia of chronic kidney disease (eGFR<30 ml/min or <45 ml/min in diabetics) consider ESA + iron therapy (if Ferritin < 100 µg/L)
- ESA therapy may be indicated in anaemic patients scheduled for surgery with significant predicted blood loss, in which iron deficiency has been excluded.
- Where the time before non-deferrable surgery is very short, combination therapy with an ESA and parenteral iron may be appropriate.

Table 4 Outlines the dosage of erythropoietin:

Dose recommended for patients with CKD:

Erythropoietin alpha or beta: 5000-10.000 U s/c week

For high risk patients: e.g. Jehovah's Witnesses:

Erythropoietin alpha or beta: 20.000 U s/c for 2 doses (one week interval)

Intravenous iron: 500 mg

5.3 **Assessment Post Treatment:** Initiated by a surgeon and followed by GPs or referring physicians

- All patients who were found to be anaemic and were given treatment should be re-assessed before surgery. In patient with persistent anaemia, a decision to delay surgery is based on clinical circumstances

- For those at risk of requiring blood transfusion, ensure group and saved or cross-matched blood has been arranged, in accordance with the MSBOS (Maximum Surgical Blood Ordering Schedule).

- Consider the feasibility of intra-operative cell salvage or post-operative cell salvage (see policy Autologous Blood Transfusion CPDI 072), depending on the nature of procedure and the amount of blood likely to be lost.

- Consider peri-operative use of Tranexamic acid (1 gr tds started on day of surgery) if blood loss if likely and there are no contraindications. Continue Tranexamic acid for 72 hours post-surgery; if appropriate. (See Appendix 9).

- Where transfusion is required, consider accepting a lower post-operative haemoglobin before transfusing blood. A transfusion trigger could be as low as 70 g/L. Consider single unit transfusion when appropriate (see policy Indications for Red Cell Transfusion 'The Green Policy', EDC 007).

- Following surgery, all patients should have their FBC checked and management should be based depending on the clinical circumstances and level of haemoglobin (see 5.2 Management of anaemia).

- If following surgery there has been a significant blood loss, the patient should be given adequate iron replacement for a period of time to ensure iron stores are rapidly replenished and the haemoglobin rises to normal as rapidly as possible.

- Iron replacement may be more than adequate treatment for post-operative anaemia and may obviate the need for post-operative transfusion. It's expected a rise of haemoglobin by 10-15 g/L in 4 weeks of treatment with oral iron and 2 weeks with intravenous iron.

- Arrangements should be made with the patients' general practitioner to ensure that the treatment of post-operative iron deficiency is appropriately managed after discharge.

6. Implementation

6.1 Dissemination

The Trust will demonstrate that this document has been issued, read and implemented as follows. A variety of dissemination methods are in place to ensure clinical staff are made aware of, have access to, and comply with this document, these include:

- Summary list of new documents published in the weekly bulletin, including a description of the document and its intended core audience.
- Inclusion on the Document Management System (DMS) on the Trust's intranet site, which all staff are encouraged to use.
- Information on the Trust intranet Blood Transfusion Web pages.

Staff should always consult the Document Management System (DMS) for the latest version of the document.

6.2 Training Arrangements

This guideline will be highlighted at all education forums by the transfusion practitioner team and discussed in more detail where relevant.

It is the responsibility of the Directorate Managers, Divisional Nurse Managers, Ward and departmental managers to ensure that staff are familiar with the content of this document and ensure that relevant training is made available as necessary.

For further information on Mandatory Training requirements and updates, staff should refer to:

- The Mandatory Training Guidance Matrix and Schedule
- The Annual Training Prospectus & Plan
- The Bi-monthly Training Bulletin

These are available on the Learning & Organisational Development Intranet page.

Staff who do not attend Mandatory Training or Induction will be highlighted on the Mandatory Training Compliance Register and will be monitored via the process outlined in the Education Training & Development Induction & Mandatory Training Policy (EDH024).

6.3 Financial Impact

There are resource implications associated with the introduction of this guideline. A business case has been submitted for the cost of implementing this document. Currently funding has been approved within the trust.

7. Monitoring Arrangements

Please see Appendix 10 for a summary of arrangements.

8. Review Arrangements

This guideline will be reviewed by the Hospital Transfusion Team and Trust Transfusion Committee every three years. It will then be approved by the Trust Transfusion Committee, before going to the Diagnostic Quality and Performance Committee for final approval. If there are any clinical indicators to review this guideline, this will be done on an ad-hoc basis.

9. Supporting Documents & References

9.1 Associated Trust Policies & Guidelines

- Education Training & Development Induction & Mandatory Training Policy, EDH 024
- Accident and Incident reporting policy, EDQ 008
- Policy on Consent to Examination or Treatment, EDQ 002

- Medicines Policy, EDC 018
- The Administration of Blood Components Policy, EDC 006
- Indications for Red Cell Transfusion 'The Green Policy', EDC 007
- Autologous Blood Transfusion Policy, CPDI 072
- The management of all patients who decline blood products including Jehovah's Witness patients' policy, CPDI 064.
- Guideline for the management of patients receiving antithrombotic drugs, CPDI 201
- Guidelines for Peri-operative Drug Administration, CPSU 037

9.2.1 Supporting References

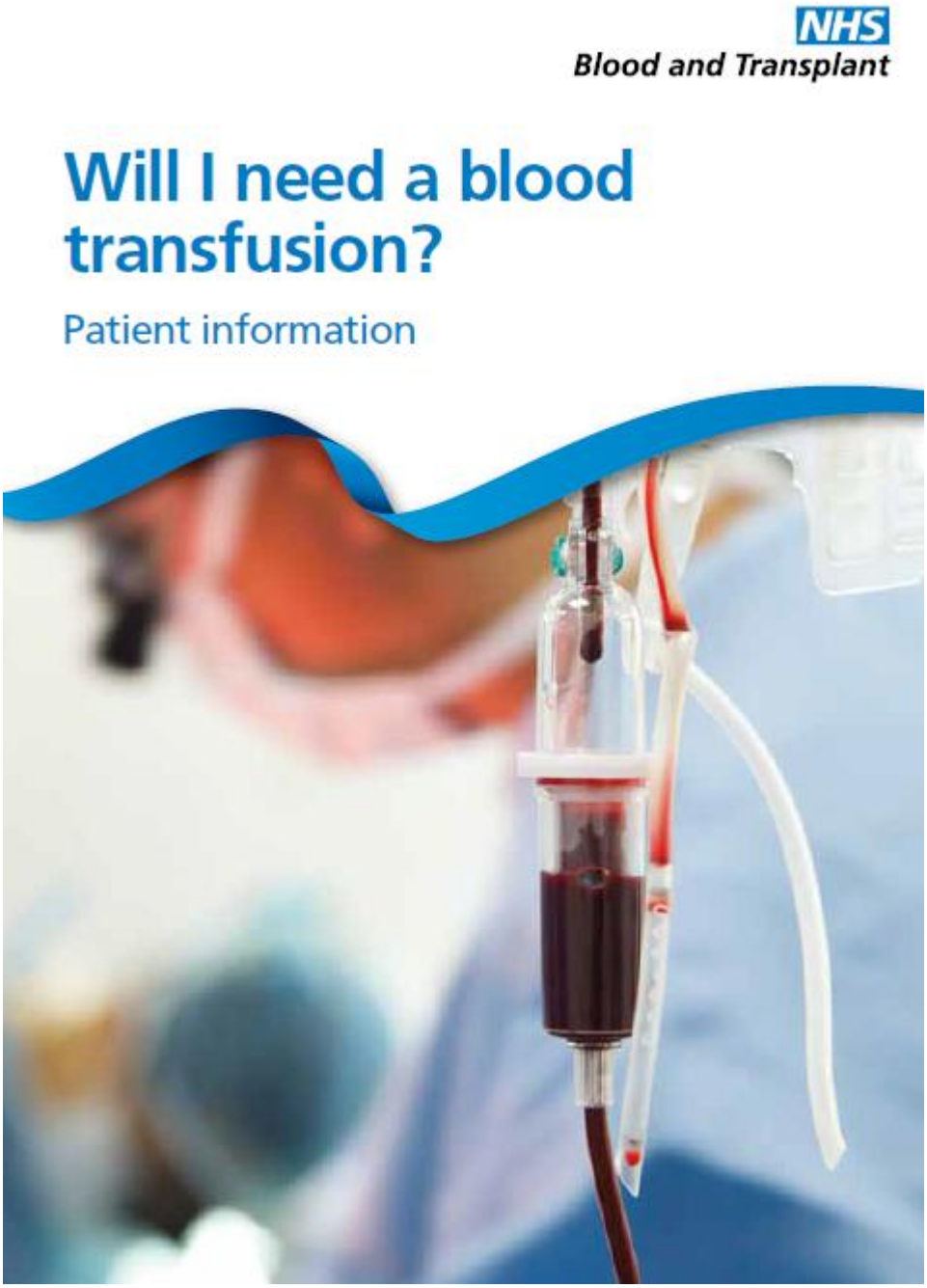
- Better blood transfusion Network iron. FACTSHEET- Transfusion guidelines version 2 February 2011
- Anaemia management in people with chronic kidney disease (CG114 NICE 2011)
- McClelland. DBL. (2013) Handbook of Transfusion Medicine 5th Edition. The Stationary Office. ISBN 0113226772
- NHSBT & NBTC Patient Blood Management Document – An Evidence based approach to patient care, 2014, http://www.transfusionguidelines.org.uk/document-library/documents/patient-blood-management-recommendations
- Blood Transfusion and the Anaesthetists: Blood Component Therapy (2005). The Association of Anaesthetists of Great Britain and Ireland, London.
- Blood Transfusion and the Anaesthetist: Red Cell Transfusion 2 (2008). Association of Anaesthetist of Great Britain and Ireland, London.
- Department of Health Toolkit - Better Blood Transfusion: Appropriate use of Blood – Preoperative Assessment: www.transfusionguidelines.org
- McClelland. DBL. (2007) Handbook of Transfusion Medicine 4th Edition. The Stationary Office. ISBN 0113226772
- NICE (2008) Inadvertent perioperative hypothermia: The management of inadvertent perioperative hypothermia in adults, NICE clinical guideline 65, London, April 2008.
- North West Region Transfusion Committee: Guidelines for the Management of Anaemia in Preoperative Assessment Clinics. (2008)

10. Abbreviations

>	Greater than
BD	Twice per day
BMS	Biomedical Scientist
CRP	C-Reactive Protein
ESA	Erythropoiesis Stimulating Agents
Fe	Iron

FBC	Full blood count
GI	Gastrointestinal
eGFR	Glomerular Filtration Rate
EDTA	Ethylenediaminetetraacetic acid
EPO	Erythropoietin
g	Grams
g/L	Grams per litre
G&S	Group & Save
Hb	Haemoglobin
HPLC	High Performance Liquid Chromatography
HTT	Hospital Transfusion Team
IDA	Iron deficiency anaemia
IM	Intramuscular
IV	Intravenous
min	minute
mg	Milligrams
mg/L	Milligrams per litre
mg/kg	Milligrams per kilogram
ml/min	Millilitres per minute
µg	Micrograms
µg/L	Micrograms per litre
MSBOS	Maximum Surgical Blood Order Schedule
NBTC	National Blood Transfusion Committee
NHSBT	National Blood Transfusion Service
NSAIDS	Nonsteroidal anti-inflammatory drugs
OD	Once per day
PAHT	Pennine Acute Hospitals Trust
POACs	Pre-Operative Assessment Clinics
SEP	Serum Electrophoresis
SHOT	Serious Hazards of Transfusion
TDS	To be taken three times a day
TTC	Trust Transfusion Committee
U&E	Urea and Electrolytes
WHO	World Health Organisation

Appendix 1 – Patient Information Leaflet for Receiving a Blood Transfusion



Information leaflet about blood transfusion
http://hospital.blood.co.uk/Library/pdf/Will_I_need_blood_tx_13_06_26.pdf

Appendix 2 – Patient Information Leaflet for Iron In Your Diet

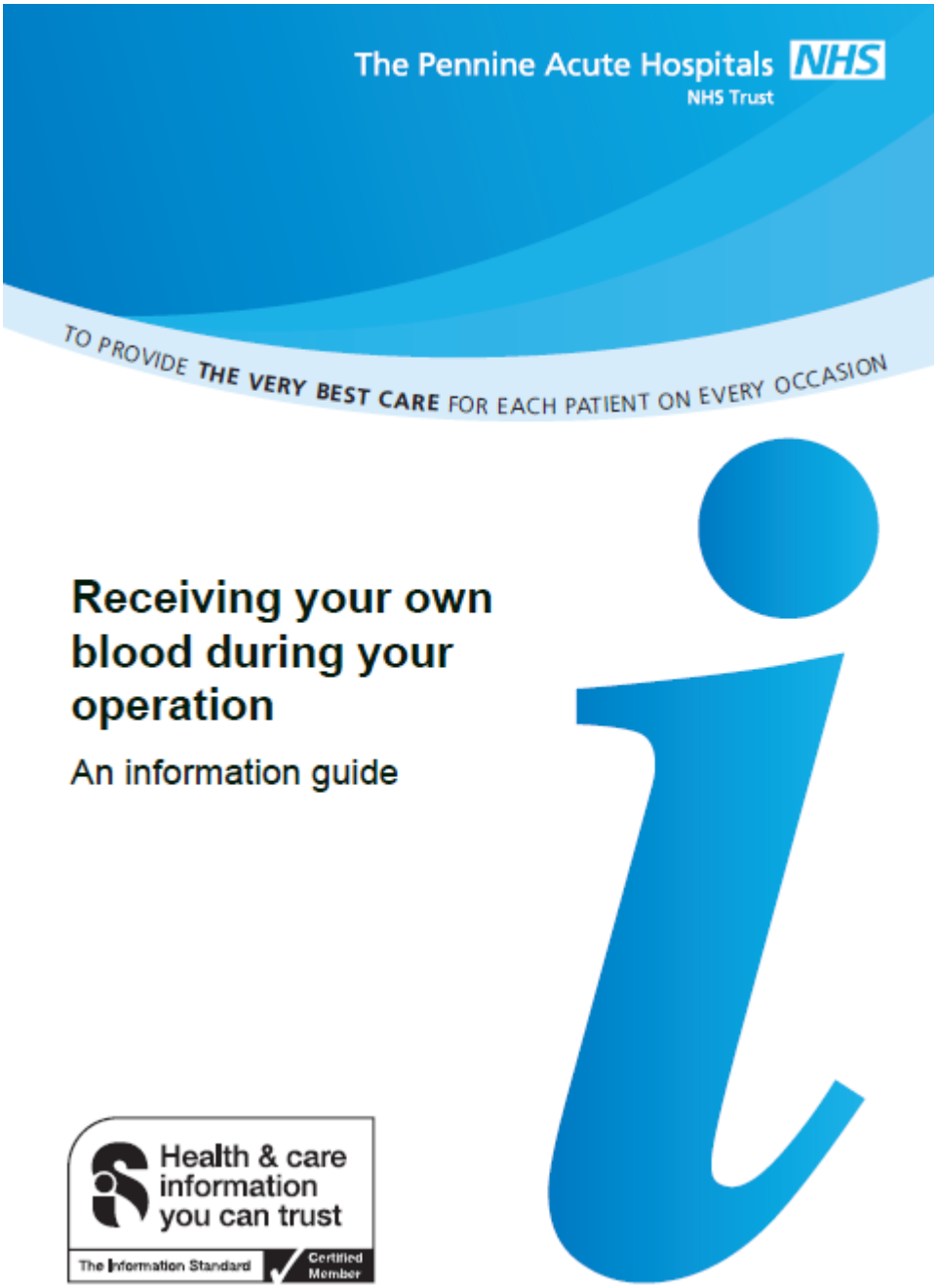
NHS
Blood and Transplant

Iron in your diet

Patient information

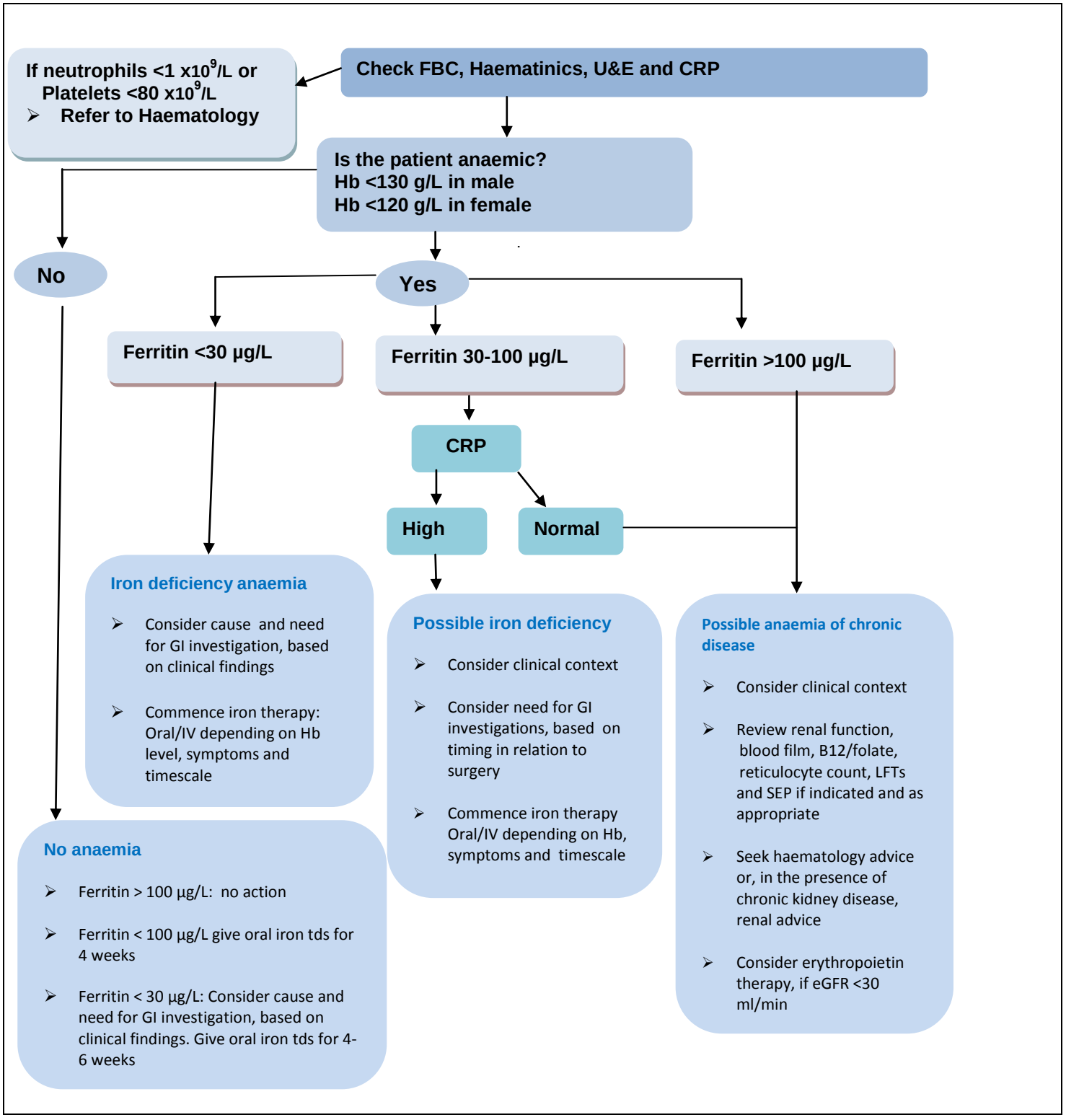
Information leaflet about Iron In Your Diet
http://hospital.blood.co.uk/Library/pdf/2011_Iron_English.pdf

Appendix 3 – Patient Information Leaflet Regarding Receiving Your Own Blood



Information leaflet about Cell Salvage

Appendix 4 – Pathway For Investigation of Anaemia (Flowchart 1)



Appendix 5 – Standard GP/Referring Doctor Information Letter

Information for GP/referring doctor of the patient who is advised to take* oral iron/oral Folic Acid/ B12 injections supplement pre-operatively

Dear Dr

Name of Patient.....

NHS number.....

Your patient was seen in the Pre-operative Assessment Clinic on: .....

Planned surgical procedure: .....

Planned surgery date: .....

Full Blood Count Results have indicated that this patient is currently anaemic. FBC Results:

Hb..... Plts..... WCC..... Ferritin …… Folate ..... B12 .....

We have decided to continue with the planned surgical procedure as detailed above. However, in order to help improve the haemoglobin prior to surgery, we initiated your patient a course of:

.....,as detailed below:

Dosage: ..... Frequency: ..... Duration: .....

NOTE: the cause of this anaemia remains clear/unclear* and may warrant further investigation by yourself.

Thank you

Signed:
Name (printed):
Date: *Delete as appropriate

Appendix 6 – Standard Patient Information Letter for Anaemia

Information for patients who are advised to take an oral iron/Folic Acid/B12 injections pre-operatively

Address, contact name and number

Dear *patient*

One of the routine blood tests taken when you came to the Pre- Operative Assessment Clinic has showed that you are mildly anaemic and/or iron and vitamin stores are low. This is not a serious problem but correction of this prior to surgery will reduce your need for transfusion either during or after your surgery, and will make you feel better and help speed up your recovery.

Your treatment for this is to take a course of:
……

……

……..……for up to……..... weeks.

After that, your response to this treatment will be assessed by a further blood test.

The form for this blood test is supplied along with this letter and can be taken to your local GP or hospital phlebotomy area.

Things you need to do are:

1. Arrange for a prescription to be obtained from your GP for the treatment listed above. Obtain a supply of this treatment. Arrange an appointment with your District Nurse if an injection is required.
2. After completion of the treatment, please take the blood sample request form to either your GP or local hospital phlebotomy service and have the repeat blood samples taken (form enclosed)
3. If you experience any problems or need any additional help or advise please contact your GP or the number above

Please note: Iron tablets sometimes have side effects, which make it difficult to continue with the treatment. These are: sickness, some discomfort in the upper part of your stomach, diarrhoea or constipation. These are common and not serious but if it makes it difficult to continue with the course of tablets please contact either your GP or hospital on the above number; they may be able to suggest another type of treatment.

Thank you

Signed:
Name (printed):
Date:

Appendix 7 – Standard Patient Information Letter For Anticoagulation Drugs

Name of Patient.....

NHS number.....

Seen in the Pre-operative Assessment Clinic on: .....

Planned surgical procedure: .....

Planned surgery date: .....

Anticoagulation drugs: …….

…….

Plan of action:

……

……

……

……

……

……

……

……

……

Signed:
Name (printed):
Date:

Appendix 8 – Referral Letter for Iron Infusion Therapy to PIU/HHDC

Referral for iron infusion treatment

Dear Matron

I would be grateful if you can arrange for this patient the following treatment:

Name of Patient..... DOB ……

Hospital number.....

Patient was seen in the Pre-operative Assessment Clinic on: .....

Planned surgical procedure: ..... Surgery date: .....

Full Blood Count Results have indicated that this patient is currently anaemic.

Hb..... Plts..... WCC..... Ferritin …….

Treatment required (tick the appropriate box):

Monofer ® 500 mg in 100 ml of sodium chloride (0.9%) over 10 min ☐

Monofer ® 1000 mg in 250 ml of sodium chloride (0.9%) over 30 min, max dose 20 mg/kg ☐

Cosmofer ® 500 mg in 500 ml of sodium chloride (0.9%) over 3-4 hours ☐

Cosmofer ® 1000 mg in 500 ml of sodium chloride (0.9%) over 3-4 hours, max dose 20 mg/kg ☐

We have decided to continue with the planned surgical procedure as detailed above.
Thank you

Signed:
Name (printed):
Date:

<u>Dose IV iron recommended</u>:
Hb >80 g/L give intravenous iron 500 mg
Hb < 80 g/L give intravenous iron 1000 mg

Appendix 9 – Protocol for Administering Tranexamic Acid

Tranexamic acid is an antifibrinolytic agent that has been widely used in the surgical settings to reduce blood loss.

Tranexamic acid is an antifibrinolytic agent widely used in the non surgical setting to reduce expected blood loss (e.g. menorrhagia). It is also used to minimise the risk of bleeding in surgical patients with known bleeding disorders (e.g. haemophiliacs, von Willibrand disease).

Licensed Indications:

- **Tranexamic acid** is licensed to treat excessive/Life-threatening bleeding after antifibrinolytic therapy
- **Tranexamic acid** is licensed for the prevention of surgical blood loss in patients with bleeding disorders (see below).

Use in the surgical setting

- **Tranexamic acid** is licensed for the prevention of surgical blood loss in patients with bleeding disorders, but is rarely used alone and other measures (such as use of DDAVP (Desmopressin), factor concentrates or other blood products) are usually more important.
  Advice on the peri-operative management of any patient with a known bleeding disorder must be sought in advance from a consultant haematologist.
- Apart from open heart surgery, **the use of antifibrinolytics in all other surgical patients is unlicensed and should be used with caution,** preferably after taking haematological advice.

Adverse effects

- Tranexamic acid occasionally causes nausea, vomiting and diarrhoea (dose dependant) and disturbance of colour vision (stop drug).

Dose of Tranexamic acid

- By mouth: 1g tds daily for up to 4 days usually commenced pre-operatively.

- By slow intravenous injection: Local Fibrinolysis, 0.5-1g 3 times daily.

- By continuous intravenous infusion: Local Fibrinolysis, following initial treatment by intravenous injection, 25-50mg/kg over 24 hours. Trauma patients, loading dose of 1g infused over 10 min within 3 hours of injury followed by maintenance dose of 1g over 8 hours.

Appendix 10

TRUSTWIDE MAXIMUM SURGICAL BLOOD ORDER SCHEDULE (MSBOS) ADULT ELECTIVE SURGERY ONLY

VASCULAR SURGERY

Aortic Surgery = 4 units

ENSURE FULL USE OF INTRA-OPERATIVE CELL SALVAGE MACHINE

GENERAL SURGERY

Liver Resection = 2 units
Whipples = 2 units
A/P Resection = 2 units
Oesophagectomy = 4 units

ORTHOPAEDIC

Femoral nailing = 2 units
Revision Surgery = 2 units
Elective Pelvic surgery= 4 units

ENSURE FULL USE OF INTRA-OPERATIVE CELL SALVAGE MACHINE AND POST-OPERATIVE CELL SALVAGE DRAINS

UROLOGY

Cystectomy = 4 units
Nephrectomy = 3 units

HEAD & NECK

Major Head & Neck Procedures = 2 units
Reconstructions = 2 units
Le Fort = 2 units

OBSTETRICS & GYNAECOLOGY

Placenta praevia = 2 units on standby
Placenta praevia for caesarean section = 4 units

ALL OTHER MAJOR SURGICAL PROCEDURES WILL BE TREATED AS A GROUP AND SAVE

*For individuals who have an increased risk of intra-operative haemorrhage, the responsible clinician will instruct the blood bank Accordingly.

Trust Transfusion Committee
06/07/09

Appendix 11

TRUSTWIDE MAXIMUM SURGICAL BLOOD ORDER SCHEDULE (MSBOS)
GROUP AND SAVE PROCEDURES
ADULT ELECTIVE SURGERY ONLY

VASCULAR SURGERY

Amputation = Group & Save
Endarterectomy = Group & Save
Fem Pop Bypass = Group & Save
EVARs = Group & Save

ENSURE FULL USE OF INTRA-OPERATIVE CELL SALVAGE MACHINE

GENERAL SURGERY

Cholecystectomy = Group & Save
Major breast surgery= Group & Save
Hemicolectomy = Group & Save
Colostomy = Group & Save
Anterior resection = Group & Save
Sigmoid Colectomy = Group & Save
Reversal Loop Ileostomy = Group & Save
Gastrectomy = Group & Save
Laparoscopy = Group & Save

HEAD & NECK

All major procedures that are not Included within the Trust's cross matching schedule.

UROLOGY

TURP = Group & Save
TURBT = Group & Save

ORTHOPAEDIC

THR = Group & Save
TKR = Group & Save

ENSURE FULL USE OF INTRA-OPERATIVE CELL SALVAGE AND POST OPERATIVE CELL SALVAGE DRAINS

OBSTETRIC & GYNAECOLOGY

LSCS = Group & Save
TAH = Group & Save

For patients who are listed for laparotomy procedures, the responsible clinician will instruct the Blood bank accordingly.

Trust Transfusion Committee
06/07/09

Appendix 12 - Arrangements for Monitoring Compliance

The arrangements for monitoring compliance of these guidelines are summarised in the following table:

Standard/ Criterion	Minimum requirement to be monitored	Process for monitoring e.g. audit	Responsible individual/ group/ committee	Frequency of monitoring	Responsible individual/ group/ committee for review of results	Responsible individual/ group/ committee for development of action plan	Responsible individual/ group/ committee for monitoring of action plan
Staff that care for elective surgical patients are aware of the appropriate treatments available to reduce the use of allogeneic blood.	Staff involved in the care of elective surgical patients are aware of their responsibilities under this guideline & act accordingly	Review of incident investigation reports as per Trust's Accident & Incident Reporting Policy (EDQ008)					
		Staff who do not attend Mandatory Training or Induction will be highlighted on the Mandatory Training Compliance Register as per the Trust's Induction & Mandatory Training Policy (EDH024)					
	Allogeneic blood usage of patients involved in any of the 4 phases of patient care in elective surgery.	Review of Incident forms where there has been a failure to follow this guideline.	Review of incident investigation reports as per Trust's Accident & Incident Reporting Policy (EDQ008)				
			Transfusion Practitioners	All reported incidents	Hospital Transfusion Team	Trust Transfusion Committee	Trust Transfusion Committee
Appropriate use of Trust/NHS Resources (blood & blood components)	Appropriate ordering and usage to minimise preventable wastage of blood & blood products	Review of Incident forms where there has been a failure to follow this guideline.	Hospital Transfusion Team	At every 6 weekly meeting	Hospital Transfusion Team	Trust Transfusion Committee	Trust Transfusion Committee
		All requests outside the guidance of the MSBOS are questioned	Laboratory BMS	All requests for allogeneic blood for elective surgery	Hospital Transfusion Team	Trust Transfusion Committee	Trust Transfusion Committee
		Review of Blood Bank Usage & Wastage Report	Hospital Transfusion Team	At every 6 weekly meeting	Hospital Transfusion Team	Hospital Transfusion Team	Hospital Transfusion Team

Appendix 13 - Completed Equality Impact Assessment for these Guidelines

The Pennine Acute Hospitals NHS Trust

Part One

Name of Document	Guideline – For the Patient Blood Management prior to Surgery	Date of assessment	September 2014	Is the document new or for review?	Review
Area	Pathology – Blood Transfusion	Name of Author(s)	Christopher Porada (On behalf of the Trust Transfusion Committee)		
1.1 Briefly describe the aims and objectives and the purpose of the document		The main aim of this guideline is to promote the safe and effective treatment for anaemia prior to surgery			
1.2 Are there any associated objectives or directives of the document? i.e. Care Quality Commission (CQC), NHS Litigation Authority (NHSLA)		Yes - Patient Blood Management Document by the National Blood Transfusion Committee (NBTC)			
1.3 Who is the document intended to benefit, and what are the expected outcomes?		All trust staff involved in the diagnosis and treatment of anaemia prior to undergoing surgery Enhance the treatment and care of patients diagnosed with anaemia prior to surgery, in order to avoid or minimise the need for an allogeneic transfusion and instead promote alternatives to a red cell transfusion.			
1.4 What factors could influence the intended outcomes either positively or negatively?		Staff not adhering to UK guidelines and patient blood management guidelines			
1.5 Who are the main stakeholders in relation to the document		*Staff *Patients			
1.6 Who implements and is responsible for the document?		Trust Transfusion Committee			

Part One (cont.)

For each of the nine Equality Categories ask the question below:	Human Rights	Age	Disability	Ethnicity (Race)	Religion	Gender	Sexual orientation	Carers	Social Deprivation
1.7 From the evidence, does the document affect or have the potential to affect individuals or communities differently or disproportionately, either positively or negatively (including discrimination)?	No	Yes	No	No	No	No	No	No	No
1.8 Is there potential for, or evidence that, the proposed document will promote equality of opportunity for all and promote good relations with different groups?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1.9 Is there public concern (including media, academic, voluntary or sector specific interest) in the document area about actual, perceived or potential discrimination about a particular community?	No	No	No	No	No	No	No	No	No
1.10 Is there any doubt about answers to any of the questions?	No	No	No	No	No	No	No	No	No

Part Two

2.1 In what way does the document impact on any particular group listed above? Include here what evidence you have collated, whether there are any gaps and what further information is required.

This document is for the treatment of Adults. A separate document is available for paediatrics and neonates for the administration of blood products.

2.2 Adverse Impact - if you have identified potential or real direct or indirect discrimination? If so, can it be justified (e.g., legislation, clinical or social evidence)?

N/A

2.3 Positive Impact - does the document actively promote equality of opportunity and/or good relations between different groups of people?

N/A

Part Three

Document Title: Guideline – For the Patient Blood Management prior to Surgery	**Document Number** CPDI 063	
Ratifying Committee Trust Transfusion Committee & The Division of Diagnostics & Clinical Support Divisional Governance Committee.	**Date sent to Committee** September 2014	
This document has been assessed as having no or low equality impact. Part 1 is completed.		
This document has been assessed as having low to medium impact. Parts 1 and 2 have been completed. Full impact assessment is unnecessary.		**Yes**
This document has been assessed as having medium to high impact. Parts 1 and 2 have been completed. **Full impact assessment is necessary.**		
Assessors Name Christopher Porada on behalf of the Trust Transfusion Committee	**Designation** Transfusion Practitioner	**Signed*** Chris Porada
Equality Champion Joanne Stephenson	**Division** Diagnostics and Clinical Support	**Signed*** Joanne Stephenson
Date: 04/09/14		