Policy for the Management of Anaemia

Department / Service:	Blood Transfusion, Pathology.
Originator:	Gill Godding, Lead Transfusion Practitioner
Accountable Director:	Suneil Kapadia Chief Medical Officer
Approved by:	Clinical Effectiveness Committee
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Target Organisation(s)	Worcestershire Acute Hospitals NHS Trust Worcestershire Health & Care Trust
Target Departments	All
Target staff categories	All staff involved in the transfusion process

Key amendments to this policy

Date	Amendment	Approved by:
June 2018	No changes to Policy. Policy changed to new format	Gill Godding
July 2020	Document extended for 6 months whilst approval and review process takes place	Gill Godding

Policy Statement

This policy details the key messages for the treatment of anaemia. It aims to identify, evaluate and manage anaemia effectively by developing a strategy for optimising red blood cell mass in most patient groups and ensure that patients consistently receive treatment which enables anaemia to be managed effectively in line with current Patient Blood Management guidelines.

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Policy for the Management of Anaemia
Introduction

Anaemia is usually defined as an insufficient production of Red Blood Cells (RBC) caused by excessive loss or destruction of RBC or haemoglobin in the blood. Common causes include iron or vitamin deficiencies, anaemia of chronic disease and bone marrow disorders. It can also be defined as a lowered ability of the blood to carry oxygen. See below table 1 for World Health Organisation (WHO) definition.

WHO's Haemoglobin thresholds used to define anaemia		
(10 g/L = 0.6206 mmol/L)		
Age or Gender Hb	**Threshold (g/l) Hb**	**Threshold (mmol/l)**
Children (0.5–5.0yrs)	110	68
Children (5–12 yrs)	115	71
Teens (12–15 yrs)	120	74
Women, non-pregnant (>15yrs)	120	74
Women, pregnant	110	68
Men (>15yrs)	130	81

Anaemia is common in the community and incidence increases with age. Prevalence rates from a large population based study in the US found rates of approximately 10% in adults over age 65; more than doubling to 23% at age ≥ 85 years.
Anaemia is independently associated with an increased risk of morbidity and mortality in both medical and surgical patients with an increased likelihood of red blood cell transfusion (RBC) transfusion. Preoperative anaemia is predictive for RBC transfusion which is associated with increased morbidity, mortality, intensive care unit length of stay and hospital length of stay.

Scope of this document

This policy applies to all Worcestershire Acute Hospitals NHS Trust workplaces and to all staff employed by the Trust as managers, providers of patient care and those who are involved in any part of patient assessment, evaluation and management of anaemia including the decision to transfuse.
This policy is a generic policy on anaemia and cannot cover all events and as such is a guide.

There are additional guidelines for certain situations and patient subgroups which apply in addition to this policy but not instead of it:

- Management of Patients who refuse Blood Transfusion (WAHT-HAE-026)
- Refusal of blood transfusion in obstetric haemorrhage (WAHT-OBS-035) Guideline on the Pre-operative Management of Adults for Elective and Scheduled Surgery Presenting with Anaemia (WAHT-HAE-027)
- Treatment and management of anaemia associated with chronic kidney disease (WAHT-REN-002)

Definitions

- **Anaemia** See Table 1.0 for WHO definition. Anaemia is usually defined as an insufficient production of Red Blood Cells (RBC) caused by excessive loss or destruction of RBC or haemoglobin in the blood.
- **Whole Blood** is a fluid made up of plasma which contains Red Blood Cells, Platelets (helps the blood to clot), White Blood Cells (defend the body from infection) and Proteins (chemicals that have various functions).
- **Red blood cells** (**RBCs**) also called erythrocytes. They are the most common type of blood cell and the principal means of oxygen delivery to the body tissues via the circulatory system. They are created in the bone marrow.
- **Erythropoietin** also known as EPO is a glycoprotein hormone which controls erythropoiesis, or RBC production. It is a cytokine (protein signalling molecule) for erythrocyte (RBC) precursors in the bone marrow. **Erythropoietin Stimulating Agents** (ESA) are drugs that stimulate RBC production (erythropoiesis). ESAs, structurally and biologically, are similar to naturally occurring protein erythropoietin.
- **Iron supplements** are drugs used in the treatment of Iron Deficient Anaemia (IDA). Iron is a key component of haemoglobin. There are 3 ways that iron can be delivered: orally, intravenously or intramuscularly.
- **Intravenous Iron** is the delivery of iron via an infusion or drip directly into a vein.
- **Haemoglobin** (Hb) is an iron containing molecule in RBC. It binds oxygen in order to carry it in the blood.
- **Iron Deficient Anaemia** (IDA) is anaemia caused by low stores of iron which result in RBC that are unable to carry sufficient amounts of oxygen or a lower amount of red blood cells in the blood.
- **Haematocrit** (HCT) is part of the 'Full Blood Count' blood test. It measures the percentage of the volume of whole blood that is made up of RBC. This measurement depends on the number of RBC and the size.
- **Haemostasis** is the body's normal physiological response for preventing and stopping haemorrhage.
- **Thalassaemia** is an inherited blood disorder characterized by abnormal formation of haemoglobin. The abnormal haemoglobin formed results in improper oxygen transport and destruction of RBC. People with thalassaemia make less haemoglobin and have fewer circulating red blood cells than normal, which results in mild or severe anaemia. Thalassaemia will present as microcytic anaemia.
- **Microcytic Anaemia** is any type of anaemia characterised by small RBC where the mean cell volume (MCV) is less than 80.0 femtolitres (normal range = 80.0-100.0)
- **Macrocytic Anaemia** is any anaemia in which the RBC is larger than normal. The mean cell volume (MCV) is more than 100.0 femtolitres.
- **Macrocytosis** is the presence of large RBC (macrocytes) in the blood.
- **Pernicious Anaemia** is anaemia due to vitamin B12 deficiency. A normal B12 range is between 191-663ng/L.
- **Vitamin B12 deficiency**, also known as **hypocobalaminaemia** is a low B12 level.
- **Anaemia of Chronic Disease** or **Anaemia of Chronic Inflammation** is a form of anaemia seen in chronic infection, chronic immune activation and malignancy.
- **Folate Deficiency** is a low level of folic acid (also known as vitamin B9). A normal folate is between 4.6-18.7 ug/L.
- **Ferritin** is a commonly found intracellular protein that stores iron and releases it in a controlled fashion. A normal range of ferritin is 15 – 350 ug/L

- **Pica** is a symptom of anaemia characterized by an appetite for substances that are largely non-nutritive, such as paper, clay, metal, chalk, soil, glass, or sand.
- **Normocytic** anaemia is anaemia with a mean cell volume (MCV) of 80-100.
- **Koilonychia** -refers to abnormally thin nails which have lost their convexity, becoming flat or even concave in shape (spoon shaped).
- **Aplastic anaemia** inability of the stem cells to generate the mature blood cells
- **Fanconi anaemia** is a rare hereditary disorder resulting in aplastic anaemia and with various other abnormalities.
- **Haemoglobinopathies**; genetic disorders resulting in a defect in the structure of the haemoglobin molecule
- **Pancytopenia** - is a condition in which there is a reduction in the number of red and white blood cells, as well as platelets.
- **Systemic lupus erythematosus**is (SLE) is an autoimmune disease in which the body's immune system mistakenly attacks healthy tissue in many parts of the body.
- **Vitiligo** is a long-term condition that causes pale, white patches to develop on the skin due to the lack of a chemical called melanin

Responsibility and Duties

Generally, medical staff assess if a patient is anaemic. They should obtain a medical history, current medication list and conduct a physical examination of the patient. Some nurses, midwives and pharmacists are also involved in medical examination, where this is the case, further training such as the Health Care Assessment Course is required treatment of the underlying condition and pharmacological treatment of anaemia is preferable to transfusion of red cells. Transfusion should only be considered when essential.
Iron therapy, ESAs and RBC transfusion are possible treatments for anaemia.
Preoperative anaemia requires identification, assessment and management in order to optimise haemoglobin and iron stores before elective surgery is scheduled.

Policy detail

Identification of anaemia

Anaemia goes undetected in many people and symptoms can be minor or vague. The signs and symptoms can be related to the underlying cause or the anaemia itself.

See list below:

- Weakness or fatigue, general malaise
- Poor concentration
- Dyspnoea on exertion
- Headaches
- Tinnitus
- Altered taste

Severe Anaemia Symptoms
In severe anaemia, the body may compensate for the lack of oxygen-carrying capability of the blood by increasing cardiac output. The patient may have symptoms related to this;

- Palpitations
- Angina (if pre-existing heart disease is present)
- Intermittent claudication of the legs
- Symptoms / Signs of heart failure.

- Poor pallor (pale skin, lining mucosa, conjunctiva and nail beds) but this is not a reliable sign. There may be signs of specific causes of anaemia e.g., koilonychia, jaundice, bone deformities or leg ulcers.
- Tachycardia
- Bounding pulse
- Flow murmurs
- Cardiac ventricular hypertrophy
- Pica may be a symptom of iron deficiency although it occurs often in those who have
- normal levels of haemoglobin
- Restless legs

Chronic anaemia in children may present as:

- Behavioural disturbances
- Poor growth
- Listlessness (as infants)

Assessment and Investigation

A thorough documentation of the patient's history is essential. The history taken should include;

- Any medical history
- All medications including complimentary and herbal supplements
- The patient's diet should be considered but do not presume poor diet is the sole cause and investigate any possible GI causes for malabsorption such as coeliac disease.
- Explore family history for haematological or clotting disorders.
- Assess any weight loss; document the patients current weight
- Assess any altered bowel habits
- Any overt bleeding
- Any blood donation should be noted
- A physical examination for any palpable masses should be undertaken and a rectal examination if suggestive of recent gastrointestinal (GI) bleeds. If the patient has no history of bleeding rectal examination can be postponed until colonoscopy**.**
- A Full Blood Count should be obtained and any trends noted

A full Blood Count will include the following:

Table 2: FBC and parameters

Test Name	Unit	Reference Range
RBC	x10^12/l	4.50 - 5.30
Hb	g/l	130 -170
Hct	l/l	0.400 - 0.500
MCV	fl	80.0 - 100.0

Low ferritin indicates low iron stores. However high ferritin can occur with inflammation and does not exclude iron deficiency.
A sample for haematinics: Vitamin B12 and folate, should be obtained and any trends noted
Routine Liver Function tests and urea and creatinine should be obtained and any trends noted.

Table 3: Haematinic, Urea and Creatinine parameters

Test Name	**Unit**	**Reference Range**

Ferritin	ug/L	15-350
Vitamin B12	ng/L	191 - 663
Folate	ug/L	4.6 – 18.7
Urea	mmol/L	2.5-7.8
Creatinine	umol/L	65-105

Consider taking a Group and Save
Consider a Sickle Cell screen dependant on ethnicity
Take any planned surgery into consideration

Interpretation of blood tests and further investigation
Serum ferritin level is the biochemical test which most reliably correlates with relative total body iron stores. Low levels of less than 15 microgram/L indicate low iron stores. However, the test can be difficult to interpret as levels can be high even in the presence of iron deficiency in Chronic Disease/Inflammation

With results showing a low MCV and Low Hb consider obtaining a transferrin saturation test. Also consider thalassaemia especially if of non-north European origin.

When anaemia is suspected and FBC and Ferritin is normal, Vitamin B12 and Folate levels will need to be assessed.

If there is evidence of pancytopenia i.e. low Hb, low WCC, low platelets please refer to haematologist on call for advice.

Routine liver function tests and renal screens may be required as ferritin levels may be influenced by co-existing conditions such as inflammation, rheumatoid disease, liver disease, malignancy, hyperthyroidism, kidney disease, or heavy alcohol intake.

Any further investigations will be determined by the blood film appearance. Blood films should be ordered and advice from Haematology sort if no distinguishing features are discovered from the FBC, Ferritin, Vitamin B12 or Folate screens.

Urinalysis for haematuria could be indicative of possible urinary tract tumours.

If iron deficient or GI blood loss is suspected, consider a gastroscopy and sigmoidoscopy. If no cause is found then consider colonoscopy. If no cause is found after colonoscopy then refer to Gastroenterology team for consideration of a capsule endoscopy.

Use the preoperative haemoglobin assessment and optimisation algorithm to guide practice for patients undergoing procedures in which blood loss is anticipated. (See Appendix 1 and the WAHT-HAE-027 Guideline on the Pre-operative Management of Adults for Elective and Scheduled Surgery Presenting with Anaemia)

Common causes of Anaemia

Anaemia may be classified as impaired RBC production, increased RBC destruction (haemolytic anaemia's), blood loss or hypervolaemia.

Disturbance of proliferation and differentiation of stem cells such as;

- Pure red cell aplasia
- Aplastic anaemia / Fanconi anaemia

Disturbance of proliferation and maturation of erythroblasts

- Pernicious anaemia is a form of megaloblastic anaemia
- Anaemia of folic acid deficiency which causes megaloblastic anaemia
- Iron deficiency anaemia
- Thalassaemia
- Anaemia of renal failure

Other mechanisms of impaired RBC production, such as malignant tumors

- The myelodysplastic syndromes (also known as MDS or myelodysplasia) are haematological medical conditions with ineffective production of all blood cells.
- Anaemia of chronic inflammation

Increased destruction (Haemolysis)

- Anaemia's of increased red blood cell destruction are generally classified as haemolytic anaemia's.

Haemoglobinopathies

- Sickle cell anaemia
- Thalassaemia

Antibody-mediated anaemia

- Warm autoimmune haemolytic anaemia
- Cold agglutinin haemolytic anaemia
- Rhesus Disease
- Transfusion reaction to blood transfusion

Medications

(Please note this is not a comprehensive list and consultation with a pharmacist is advised)Any drugs that are absorbed onto the surface of the RBC such as;

- Antibiotics; Penicillin, Cephalosporins
- Anticonvulsants
- Anticoagulants
- Immune complex mediated therapies
- NSAIDS

Mechanical trauma to RBC

- Infections e.g. septicaemia and malaria (when taking a history enquire on recent travel destinations)
- Heart surgery where cardiac bypass is used
- Haemodialysis

Blood loss

- Iatrogenic anaemia from frequent blood sampling for arterial gases and/or laboratory testing combined with insufficient RBC production.
- Trauma or surgery
- Gastrointestinal or chronic blood loss (e.g. angiodysplasia, varices, bleeding ulcers)
- Gynaecologic disturbances causing chronic blood loss e.g. fibroids
- From menstruation
- Parasitic infection by intestinal worms; question patients on recent travel or country of origin a Consider a faecal sample to be sent for parasitic investigation

Fluid overload

- Examine the patient to identify possible fluid overload which can cause decreased haemoglobin concentration and apparent anaemia
- Anaemia of pregnancy can be induced by blood volume expansion experienced in pregnancy

Iron Deficient Anaemia (IDA)

Iron deficiency anaemia is the most common type of anaemia overall and it has many causes.

The initial classification for IDA is based on the Mean Cell Volume (MCV) as part of a FBC.

- IDA is due to insufficient dietary intake or absorption of iron to meet the body's needs. Infants, toddlers, teenagers and pregnant women have higher than average needs. Those with a poor, restrictive or limited diet are also at risk.
- Increased iron intake is also needed to offset blood losses due to digestive tract issues, frequent blood donations or heavy menstrual periods.
- The most common cause of iron deficiency is bleeding or blood loss, usually from the gastrointestinal tract. Upper endoscopy and lower endoscopy should be performed to identify bleeding lesions. In older men and women, the chances are higher that bleeding from the gastrointestinal tract could be due to colon polyps or colorectal cancer and this should be ruled out.
- Anaemia of chronic disease can be due to the inability to use iron and present with microcytosis.
- Serum ferritin concentration is a useful test for IDA. A serum ferritin concentration of <12 µg/dl is diagnostic of IDA. However, serum ferritin may be raised above 12–15 µg/dl in patients with IDA and concurrent chronic inflammation, malignancy, or hepatic disease, although if the concentration is >100 µg/dl, IDA is almost certainly not present.

Management of Iron Deficiency Anaemia

For the majority of patients the aim of treatment should be to restore haemoglobin levels and MCV to normal and replenish body stores by iron supplementation. If this cannot be achieved further evaluation by a haematologist may be needed. In patients with iron deficiency anaemia (IDA), iron therapy is required to replenish iron stores regardless of whether a transfusion is indicated. Target haemoglobin and MCV levels are usually lower in renal patients and advice from a nephrologist should be sought

Oral Iron Therapy

Adverse effects of oral iron supplements are a common cause of non-compliance with treatment, 10% to 20% of people are thought to discontinue iron supplements because of adverse effects. Adverse effects are dose related and are therefore directly related to the amount of iron absorbed. The incidence of adverse effects is no different between any the iron supplements.
Drug interactions may occur in people receiving oral iron supplements, resulting in reduced iron absorption or interference with other medicines.
Investigation and treatment of an underlying cause should prevent further iron loss but all patients should have iron supplementation both to correct anaemia and replenish body stores. This is achieved most simply with ferrous sulphate 200 mg three times daily, although ferrous fumarate is as effective.

Aiding Compliance

- The frequency of gastrointestinal side effects related to each different preparation is directly related to the content of ferrous iron (see Table 4 below).
- If iron is poorly tolerated consider reducing frequency of dose e.g. instead of ferrous sulphate 200 mg three times daily reduce to once or twice daily.
- Alternatively use a liquid preparation (elixir) as these may be tolerated when tablets are not.
- When commencing oral iron supplements consider slowly increasing the dose starting at once daily and building up to full daily dose over the course of 1-2 weeks to help reduce side effects and encourage compliance.

Worcestershire Formulary - Table of Ferrous Iron Content

Iron Salt	Available Dose	Preparation	Therapeutic Dose	Content of ferrous iron
Ferrous sulphate	200mg	tablets	TDS	65mg
Ferrous Fumarate (generic)	210mg 140mg/5ml	Tablets Syrup	BD or TDS 10ml BD	68mg 45mg/5ml

Ascorbic acid (Vitamin C) enhances iron absorption and should be considered when response is poor.
IV Iron should be used as second line treatment only when there is intolerance to at least two oral preparations or noncompliance.
Oral iron should not be given alongside IV iron.

Haemoglobin concentration should rise by 20 g/l after 3–4 weeks. Failure to do so is usually due to poor compliance, misdiagnosis, continued blood loss, or malabsorption. Rescreen patient and refer to haematology if no cause discovered.

Intravenous Iron Therapy
For the use of IV iron, see the Guideline for the Use of Intravenous Iron (Ferric Carboxymaltose, Ferinject).These guidelines are to be found on the Blood Transfusion treatment pathway

Consider admission in IDA if:

- Possible malignancy or infiltrative disorder
- Hb < 60 g/l
- Haemolysis
- Requires transfusion. Where possible defer transfusion until a definitive diagnosis is made to avoid inappropriate transfusion. Please refer to Blood Transfusion Treatment pathway for indication for red cell transfusion.

Recommended follow up of IDA by GP

- When referring the patient back to their GP a repeat test of their Hb 6-8 weeks after commencement of iron supplements should be taken.
- Oral iron supplementation should be continued for three months after correction of anaemia to replenish iron stores.
- Once normal, the haemoglobin concentration and red cell indices should be monitored at regular intervals. Recommended time schedule three monthly for one year and then after a further year.
- Additional oral iron should be given if the Hb or MCV falls below normal and ferritin levels should also be repeated at this point.
- Further investigation is only necessary if the Hb and MCV cannot be maintained in this way.

Vitamin B12 Deficiency causing anaemia

- Vitamin B12 deficiency causes macrocytosis.

- Vitamin B12 deficiency in developed countries is commonly due to pernicious anaemia due to undernourishment from a restricted or poor diet that is limited in foods of animal origin including milk, cheese, yoghurt and eggs.
- Recommended daily requirement of vitamin B12 is small (1-2 µg/day) compared with total body stores (2000-5000 µg) much of which is stored in the liver. This means it can take years for vitamin B12 deficiency to develop.
- For the patients with a very low serum B12 level (<100ng/l) and anaemia, macrocytosis or neurological symptoms treatment is to load the patient with vitamin B12 given by IM injection and continue with maintenance vitamin B12 by IM injection every 3 months indefinitely. Intra muscular administration is preferred as the effectiveness of oral therapy might be compromised if a malabsorptive condition is the cause of the deficiency.
- Asymptomatic patients usually have moderately or mildly low vitamin B12 levels of 150-180ng/l. In this situation it is common not to find a cause for the vitamin B12 deficiency patients who have a serum vitamin B12 >150ng/l. It is advisable to repeat the test and confirm the deficiency.
- Patients presenting with significant haematological and/or neurological consequences need to be treated promptly and effectively with vitamin B12 replacement.
- A careful history concentrating on the patient's diet, drug therapy and previous medical history is important in distinguishing the cause of vitamin B12 deficiency. Other features such as a family history and signs of autoimmune disorders (especially thyroid disease and vitiligo) may point towards a diagnosis of pernicious anaemia

Indications for measuring serum vitamin B12 level

Haematological (in increasing order of severity)
- Isolated red cell macrocytosis
- Macrocytic anaemia (esp. if MCV >110fl)
  Pancytopenia (esp. if MCV >120fl)

Neurological or psychiatric
- Peripheral neuropathy
- Cognitive change e.g. dementia
- Optic neuritis

Gastrointestinal
- Investigation of possible malabsorptive process

Other (rare)
- Sore inflamed skin at the corner of the mouth
- Sore thick, heavy red tongue

Haematological complications of vitamin B12 deficiency can present in the absence of neurological problems and vice versa.

Causes of Vitamin B12 Deficiency

Inadequate vitamin B12 in diet e.g. strict vegan or poor diet leading to malnourishment
- Oral contraceptive pill **-** due to a reduction in the level of the vitamin B12-carrying

Vitamin B12 Malabsorption due to:
- Pernicious anaemia
- Long term use of PPI
- Chronic alcoholism
- Pancreatic failure
- Coeliac disease **-** this much more commonly causes iron and/or folate deficiency but 10-30% of coeliac patients can have evidence of vitamin
- B12 deficiency

- Gastrectomy
- Small bowel surgery
- Generalised malabsorption
- Inflammatory bowel disease
- Drug induced (especially anti-metabolites that interfere with DNA synthesis and cell division)

Investigations of Vitamin B12 Anaemia

- Anti-intrinsic factor (anti-IF) antibodies
- Anti-gastric parietal cell (anti-GPC) antibodies
- Thyroid function tests and anti-thyroid antibodies
- Coeliac Disease test - Tissue transglutaminase (tTG)

Treatment of Vitamin B12 Deficiency; Dosages

Pernicious anaemia and other macrocytic anaemias without neurological involvement

- Give intramuscular Hydroxocobalamin 1 mg 3 times a week for 2 weeks then 1 mg every 3 months

Pernicious anaemia and other macrocytic anaemias with neurological involvement

- Give Hydroxocobalamin 1 mg IM on alternate days until no further improvement, then 1 mg every 2 months.

Prophylaxis of macrocytic anaemias associated with vitamin B12 deficiency

- Give Hydroxocobalamin IM 1 mg every 2–3 months.

Tobacco amblyopia and Leber's optic atrophy

- initially give Hydroxocobalamin IM 1 mg daily for 2 weeks, then 1 mg twice weekly until no further improvement, thereafter 1 mg every 1–3 months

It may be necessary to add folic acid 5mg PO daily for 4 weeks to patients with anaemia due to vitamin B12 deficiency. This avoids the possibility of inducing folate deficiency as a consequence of increased red cell production that should follow after providing a source of the previously deficient vitamin B12.

Assessing for folate deficiency

- Diagnosis of anaemia caused by folate deficiency is made through history, examination, and investigations, including taking a full blood count, blood film, and measuring serum concentrations of folate.
- Determine whether the person has experienced complications of anaemia or folate deficiency using the signs and symptoms documented below.
- If folate levels are low, and the history suggests malabsorption, check for coeliac disease
- Folate deficiency can occur for a number of reasons, including:
    - Dietary deficiency.
    - Malabsorption.
    - Excessive requirements: Pregnancy, prematurity, and infancy.
    - Malignancy (e.g. leukaemia, carcinoma, lymphoma).
    - Blood disorders (e.g. haemolytic anaemias).
    - Inflammation (e.g. tuberculosis, Crohn's disease).
    - Metabolic causes (e.g. homocystinuria).
    - Excessive urinary excretion (e.g. chronic dialysis).
    - Drugs (e.g. anticonvulsants, colestyramine, sulfasalazine, methotrexate)

Treatment of folate deficiency includes:

- Oral folic acid 5 mg daily. In most people, treatment will be required for 4 months. Folic acid may need to be taken longer term (sometimes for life) if the underlying cause of deficiency is persistent.
- Dietary advice. Good sources of folate are broccoli, brussel sprouts, asparagus, peas, chickpeas, and brown rice

Anaemia of Chronic Disease (ACD)

- ACD is caused by high levels of inflammatory cytokines and is seen in patients with inflammatory, infectious or malignant diseases as well as conditions such as diabetes, renal disease and congestive heart failure.
- The anaemia is often mild and fluctuates with disease activity or response to treatment of the underlying medical condition.
- If patients are symptomatic from anaemia or Hb levels need to be improved before surgery (e.g. joint replacement in patients with rheumatoid arthritis), treatment with intravenous iron or an erythropoiesis stimulating agent (ESA) maybe beneficial. ACD in patients with active rheumatoid arthritis or inflammatory bowel disease may be improved by treatment with monoclonal antibodies, such as anti-TNF, that reduce the inflammatory response.

When to Refer to Haematology

Urgent referral to Haematology:

- Blood film abnormalities (refer if suggested by the Haematologist.)
- Associated cytopenias (platelets <80 and / or neutrophils <1.0).
- Lymphadenopathy or splenomegaly with anaemia.
- Unexplained, progressive or severe anaemia.

Non Urgent Referral to Haematology:

- Symptomatic patients with unexplained anaemia (e.g. Hb 20g/L below their normal).
- Failure of response to oral iron (following appropriate investigation for cause of iron deficiency). Investigations prior to referral – Ferritin / transferrin saturation, B12/ Folate, renal and liver biochemistry, serum electrophoresis.

Indications to transfuse red blood cells

The indications for transfusion are documented within the main blood transfusion policy.

MONITORING AND COMPLIANCE				
This section should identify how the Trusts plan to monitor compliance with and the effectiveness of these documents. It should include auditable standards and/or key performance indicators (KPIs) and details on the methods for monitoring compliance				
What	**How**	**Who**	**Where**	**When**
These are the 'key' parts of the process that we are relying on to manage risk.	*What are we going to do to make sure the key parts of the process we have identified are being followed?*	*Who is responsible for the check?*	*Who will receive the monitoring results?*	*Set achievable frequencies.*
The key parts of the transfusion processes are: • The decision to transfuse • Patient information and consent • Appropriate prescribing of blood • The request for transfusion • Collection and delivery of blood components • The administration of blood • Monitoring the patient throughout the process • Completion and documentation of the event • Management of transfusion reactions	An Audit will be completed to establish if the key parts of the process are being followed	Transfusion practitioners	Trust Transfusion committee	yearly

CONSULTATION	
This Treatment pathway has been circulated to the following individuals for consultation	
Name	**Designation**
Dr Thomas Skibbe	Consultant Haematologist
Dr Alyson McClung	Consultant physician
Dr Nick Turley	Consultant A&E
Dr Shiju Mathew	Consultant anesthetist
Dr Baylon Kamalarajan	Consultant paediatrician
Mr Steve Goodyear	Consultant surgeon - vascular
Catherine Hilman-Cooper	Consultant Obstetrics
Manon Van Setters	Consultant gynaecologist
Jane Brown	Clinical Governance facilitator
Cathy Lim	National blood service liaison
Rebecca Thompson	Community IV therapy lead
Camran Khan	Transfusion Laboratory manager
Juliette Stone	Senior Sister Theatres
Debra Clinton	Assistant Transfusion practitioner
Jon Dickens	Charge Hand A&E
This Treatment pathway has been circulated to the chair(s) of the following committee's / groups;	
Trust Transfusion Committee	
Safe Patient group	

IMPLEMENTATION
Plan for implementation
How are you going to implement and ensure all relevant staff are aware of this pathway?
The individual members of the transfusion committee will be responsible for informing their relevant clinical directorate
The updated pathway will be presented at the link nurse day. The link nurses will cascade the information to the ward teams

DISSEMINATION
A link of the blood transfusion treatment pathway will be forward to all matrons, and ward managers once the pathway has been ratified

TRAINING AND AWARENESS
This section should refer to training as identified in the Trusts Training Needs Analysis Appendix A of the Trusts Mandatory Training Policy
All staff involved in the transfusion process should be trained and competent in the process they are taking part in. The training is described in the Trusts Training Needs Analysis Appendix A of the Trusts Mandatory Training Policy

SUPPORTING DOCUMENT ONE – EQUALITY IMPACT ASSESSMENT TOOL		
To be completed by the Treatment pathway owner and submitted to the appropriate committee for consideration and approval.		
		Yes/No
1.	Does the treatment pathway affect one group less or more favourably than another on the basis of:	**no**
	Race	**no**
	Ethnic origins (including gypsies and travellers)	**no**
	Nationality	**no**
	Gender	**no**
	Culture	**no**
	Religion or belief	**no**
	Sexual Orientation	**no**
	Age	**no**
2.	Is there any evidence that some groups are affected differently?	**no**
3.	If you have identified potential discrimination, are any exceptions valid, legal and/or justifiable?	**no**
4.	Is the impact of the policy/guidance likely to be negative? If so can the impact be avoided?	**no**
5.	What alternatives are there to achieving the policy/guidance without the impact?	**no**
6.	Can we reduce the impact by taking different action?	**no**
7.	Other comments	**none**

If you have identified a potential discriminatory impact of this key document, please refer it to Human Resources, together with any suggestions as to the action required to avoid/reduce this impact.

For advice in respect of answering the above questions, please contact Human Resources.

SUPPORTING DOCUMENT TWO – FINANCIAL IMPACT ASSESSMENT		
To be completed by the Treatment pathway owner and submitted to the appropriate committee for consideration and approval.		
		Yes/No
1.	Does the implementation of this document require any additional Capital resources	**no**
2.	Does the implementation of this document require additional revenue	**no**
3.	Does the implementation of this document require additional manpower	**no**
4.	Does the implementation of this document release any manpower costs through a change in practice	**no**
5.	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programmes or allocated training times for staff	**no**
6.	Other comments	**none**

If the response to any of the above is yes, please complete a business case and which is signed by your Finance Manager and Directorate Manager for consideration by the Accountable Director before progressing to the relevant committee for approval