VENESECTION POLICY AND PROCEDURE

BACKGROUND

The procedure involves the removal of a specified amount of blood, approx. 450 mls, by venepuncture. Therapeutic venesections are regularly carried out as treatment for haematological disorders. The frequency of venesections is determined by the levels of various markers within the patient's blood.

Patients requiring venesection fall into 3 main categories

- Genetic Haemochromatosis
- Transfusion associated iron overload
- Polycythaemia

Genetic Haemochromatosis

Genetic haemochromatosis (GH) is a genetic disorder causing the body to absorb an excessive amount of iron from the diet. Unable to eliminate this excess iron the body stores it within the major organs in the form of ferritin. Although the liver is most commonly affected, the heart, pancreas and other endocrine glands can also be damaged.
GH is an autosomal recessive disorder with the majority of people homozygous for the **C282Y** mutation in the HFE gene. A diagnosis is made on the presence of the genetic mutation ***plus evidence of iron overload,*** demonstrated by an ***elevated*** ferritin + transferrin saturation. Homozygosity for a further mutation in the HFE gene **H63D** is also associated with iron loading but to a lesser extent.

Treatment is performed in the nurse-led clinic and is managed by the haematology nurse specialist.
Treatment falls into 2 distinct phases: **iron depletion** & **maintenance.**
The aim of iron depletion is to empty the iron stores in the body by regular venesection every 1-2 weeks until the ferritin is < 20 microg/l and the transferrin saturation is < 16%. This may take up to 2 years depending on the level of iron loading at diagnosis. The Hb is monitored carefully and frequency of venesection adjusted accordingly.
Maintenance refers to the ongoing monitoring of iron levels with the aim of keeping the ferritin < 50 microg/l and the transferrin saturation < 50%. Patients are reviewed every 3 months either in clinic or by telephone with their blood results from samples taken approx. 2 weeks earlier. If either the ferritin or transferrin saturation is elevated, a venesection is performed in clinic. Any abnormal results are discussed with the consultant/SpR.

Transfusion Related Iron Overload

Multiple blood transfusions during chemotherapy treatment may result in iron overload which the body stores and can be damaging to vital organs. Many patients receiving intensive chemotherapy for conditions such as acute leukaemia will develop hyperferritnaemia. Venesection is needed to bring the ferritin back to near normal values and thus reduce the risk of long term complications.
The procedure is carried out in the nurse-led clinic approximately every 4 weeks. The aim is to reduce the **ferritin < 500microg/l.** The number of venesections required will depend on the initial ferritin. The Hb is monitored carefully and frequency of venesection adjusted accordingly

Polycythaemia

Polycythaemia is a condition in which the haematocrit is elevated. This results in hyper viscosity of the blood leading to an increased risk of thrombosis such as stroke, DVT and PE. Polycythaemia may be diagnosed following one of these events, but patients may also present to the G.P with a variety of symptoms including tiredness, itching or headaches. A proportion of patients will be asymptomatic and the condition is picked up on a routine blood test.

There are two main types of Polycythaemia, Absolute and Relative.
Absolute polycythaemia refers to an increase in the number of red blood cells, whereas relative polycythaemia refers to a decrease in blood volume.

Absolute Polycythaemia may be due to a primary process in the bone marrow resulting in a myeloproliferative disorder. This is known as **Primary Polycythaemia.** 90% of patients with this condition will have the JAK 2 mutation.
It may also be a reaction to a chronically low level of oxygen as a result of heavy smoking. This is known as **Secondary Polycythaemia**

Relative Polycythaemia is often due to a loss of body fluids from either dehydration, burns, medications or stress

Treatment is aimed at reducing the Hct, by regular venesection alone or with the addition of an oral chemotherapy agent in patients with Primary Polycythaemia.

Patients with a relatively stable Hct by venesection alone will be referred by the consultant to the nurse-led clinic for management. The clinical nurse specialist will review the patient with a recent FBC and to discuss symptoms. An agreed target Hct will be documented in the patient notes. Venesection will be performed if the target is exceeded or if the patient is symptomatic.

Typically, the target Hct for a patient with Primary Polycythaemia is **0.45**

Secondary Polycythaemia is **0.50**

Relative Polycythaemia is **0.54**

However, this may differ for individuals depending on symptoms, history of thrombosis and associated risk factors.

VENESECTION PROCEDURE

The procedure may be performed by a qualified nurse or health care support worker who has received the appropriate training (see appendices).

Assess patient prior to procedure

- Check patient details against treatment plan within patient notes.
- Ensure recent Hb result is available. Do not proceed if Hb below acceptable level as documented in treatment plan.
- Ensure that the patient is fully informed of procedure and has any concerns addressed.
- Confirm that the patient is feeling well and has eaten and drank within 2 hours of procedure due to commence.
- Offer oral fluids.
- Take base line observations of pulse and blood pressure, prior to first venesection or if previous episodes of hypotension during or following procedure. Do not proceed if hypotensive.
- Ensure that patient has not taken anti-hypertensive agents immediately prior to procedure.

Equipment List

- Venesection bag (integrated blood collection system comprising needle, collection bag, and sampling port)
- Tourniquet
- Skin prep
- Local anaesthetic spray or local anaesthetic cream if required.
- Gauze
- Secure dressing
- Blood bottles as required
- Gloves and apron
- Scales
- ‘Stress reliever’ (to squeeze during procedure)
- Bandage

PROCEDURE	RATIONALE
1. Position patient on bed or couch for procedure.	In case of hypotensive episode.
2. Assess the antecubital fossa veins. Support arm with a pillow and apply tourniquet	To identify large enough vein to support venesection needle. To maintain patient comfort.
3. Using ANTT clean skin with Chloroprep and allow to dry.	To avoid introducing infection with needle puncture.
4. Puncture vein, and secure needle with dressing once blood flow established	To avoid dislodgement of needle
5. Place collection bag at lower level than needle	For maintenance of blood flow.
6. Once a good blood flow is established, Release tourniquet.	To restore blood flow to lower arm and prevent discomfort.
7. Once required amount of blood has been removed, remove needle and apply pressure to site.	To stop bleeding from needle puncture site.
8. Once bleeding has stopped, apply bandage which is to be left in situ for at least 2 hours. Warn patient against heavy lifting.	To prevent bleeding from site.
9. Re-sheath needle and dispose of bag in sharps bin.	To prevent needle stick injury and contamination.

TROUBLESHOOTING GUIDE

PROBLEM	**PLAN**
1. Needle phobia	Offer local anaesthetic cream or spray. Make sure patient is fully informed of procedure and is given opportunity to discuss fears. Refer to hypnotherapist.
2. Unable to identify suitable vein in either arm.	Do not attempt venepuncture. Give patient opportunity to take oral fluids, & apply heat to dilate vein. Reschedule appt. if necessary.
3. No blood flow following insertion of needle	Do not manipulate needle. Remove and resite in another vein. Do not make more than 2 attempts. Seek assistance.
4. Blood flow ceases	Ensure tubing is not kinked and venesection bag is well below level of needle. Ask patient to grasp & release fist to promote blood flow. Reapply tourniquet. Remove needle & resite if required amount of blood has not been removed.
5. Patient feels light headed	Stop procedure. Lower patients head. Remove needle and dispose of correctly. Observe patient, check blood pressure. Keep in supine position until feeling better. Ensure blood pressure restored before patient is discharged.

VENESECTION THERAPY AND MONITORING OF PATIENTS WITH GENETIC HAEMACHROMOTOSIS

INTIAL THERAPY FOR NEWLY DIAGNOSED PATIENTS	
WEEKLY VENESECTIONS OF 450 – 500 MLS OF BLOOD UNTIL **SERUM FERRITIN < 20 micrograms/L** **TRANSFERRIN SAT < 16 %** Patients who cannot tolerate weekly venesections can be placed on a 2 weekly regime. Intravenous fluids may be considered. In older patients or those with significant co-morbidities, the regime can be reduced to monthly and /or the volume of blood removed can be reduced.	Monitor • Hb weekly • Serum Ferritin monthly • Transferrin Saturation when Ferritin < 100 µg/l

MAINTENANCE THERAPY TO BE INITIATED WHEN SERUM FERRITN > 50µg/ l	
3 MONTHLY VENESECTIONS DEPENDING ON BLOOD RESULTS	Monitor Serum Ferritin – maintain < 50 **µ**g / l • Transferrin Saturation maintain < 50% • Hb - maintain > 120g/l • LFTs - contact Consultant if abnormality detected or if deterioration in results.

ANNUAL MEDICAL REVIEW	Blood tests prior to review • Alphafetoprotein • Glucose • LFTs • FBC • Ferritin • Transferrin Saturation Only organise liver ultrasound if abnormal LFTs or known liver disease at diagnosis.

VENESECTION THERAPY AND MONITORING OF PATIENTS WITH PRIMARY POLYCYTHAEMIA

INTIAL THERAPY FOR NEWLY DIAGNOSED PATIENTS	
WEEKLY VENESECTIONS OF 450 – 500 MLS OF BLOOD UNTIL HCT < 0.45 Please refer to individual target in patient's notes.	Monitor • Hb – maintain > 120g/L • HCT weekly • Symptoms – Headaches Visual disturbances Itching Thrombotic events Peripheral circulation

MAINTENANCE THERAPY WHEN HCT < 0.45	
4-6 WEEKLY VENESECTIONS DEPENDING ON BLOOD RESULTS	Monitor • HCT- maintain < 0.45 • Hb - maintain > 120g/l • Symptoms – Headaches Visual disturbances Itching Thrombotic events Peripheral circulation

ANNUAL REVIEW WITH CONSULTANT HAEMATOLOGIST	Blood tests prior to review • FBC • Lipid profile • Glucose • RLB

VENESECTION THERAPY AND MONITORING OF PATIENTS WITH SECONDARY AND RELATIVE POLYCYTHAEMIA

INTIAL THERAPY FOR NEWLY DIAGNOSED PATIENTS	
WEEKLY VENESECTIONS OF 450 – 500 MLS OF BLOOD UNTIL HCT < 0.50 /0.54 Please refer to individual target in patient's notes.	Monitor • Hb – maintain > 120g/l • HCT weekly • Symptoms – Headaches Visual disturbances Itching Thrombotic events Peripheral circulation

MAINTENANCE THERAPY WHEN HCT < 0.45	
2-3 MONTHLY VENESECTIONS DEPENDING ON BLOOD RESULTS	Monitor • HCT- maintain below target. • Hb - maintain > 120g/l • Symptoms – Headaches Visual disturbances Itching Thrombotic events Peripheral circulation

ANNUAL REVIEW WITH CONSULTANT HAEMATOLOGIST	Blood tests prior to review • FBC • Lipid profile • Glucose • RLB

NURSE LED VENESECTION SERVICE- REFERRAL PATHWAYS

HAEMOCHROMATOSIS

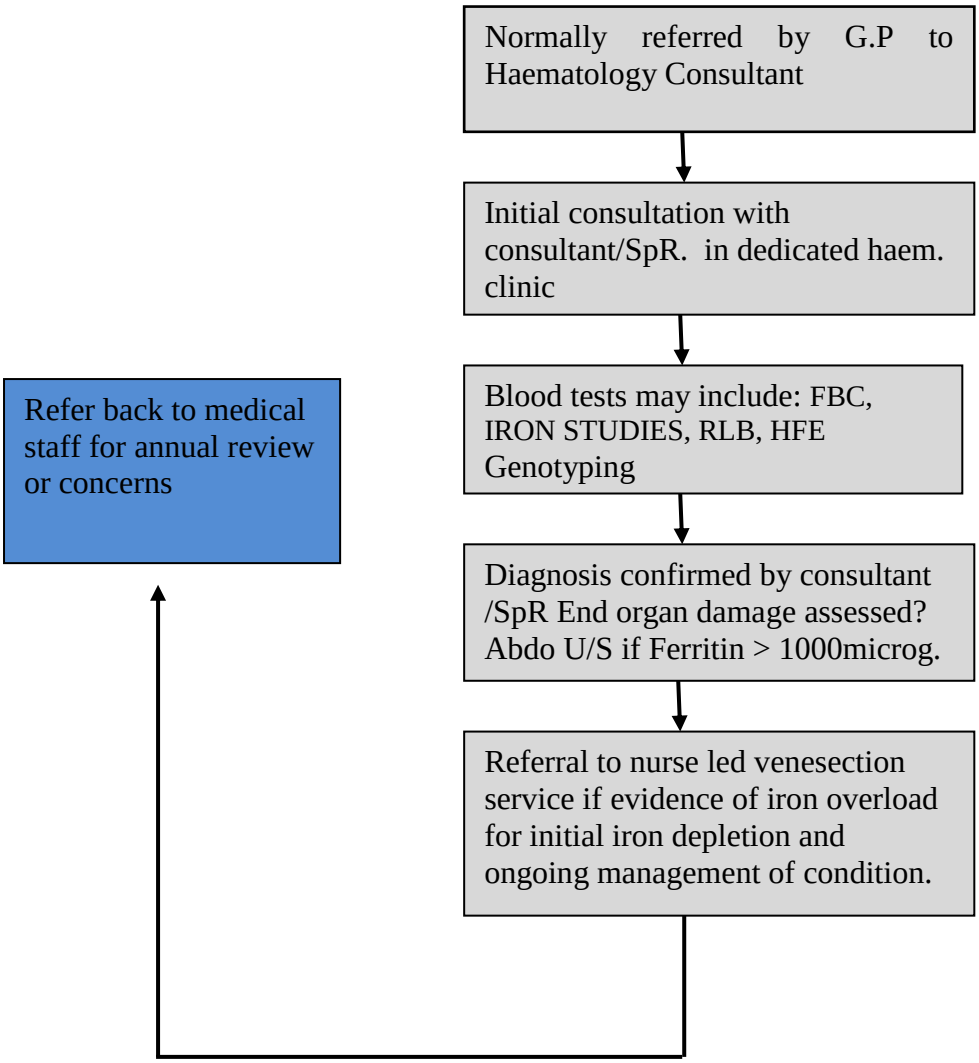
Iron overload, also known as **haemochromatosis**, indicates accumulation of iron in the body from any cause. The most important causes are

1. Hereditary **haemochromatosis** (HHC), a genetic disorder.
2. Transfusional iron overload, which can result from repeated blood transfusions.

Excess iron stores can lead to organ damage such as diabetes mellitus, liver cirrhosis and heart failure.

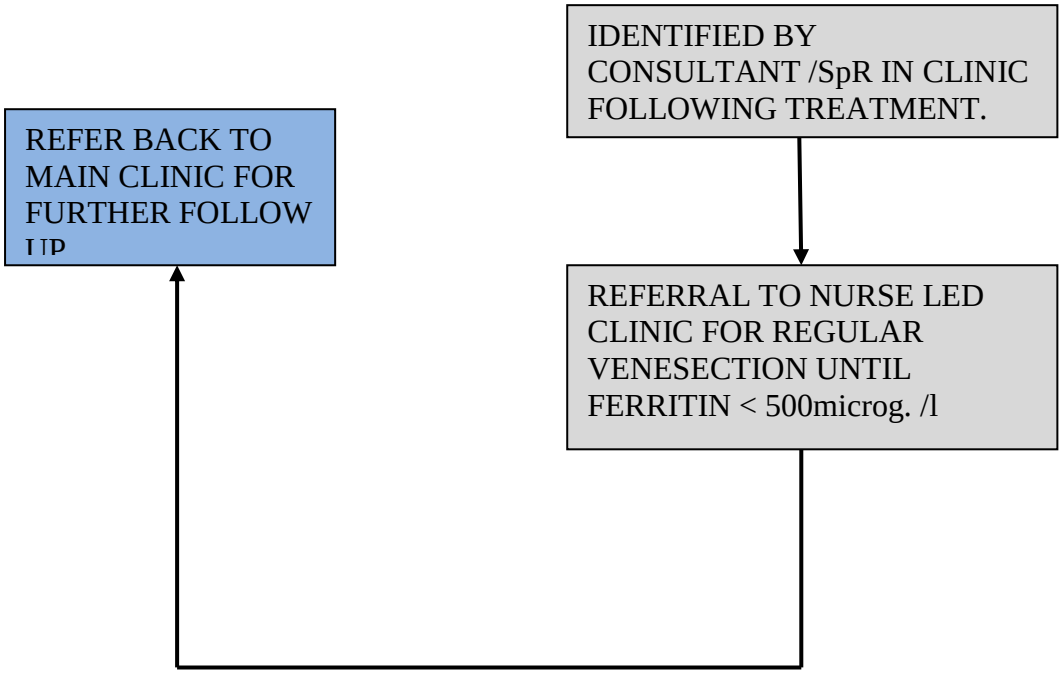
1.HEREDITARY HAEMOCHROMATOSIS

Hereditary haemochromatosis (HH) remains the most common, identified, genetic disorder in Caucasians, most commonly in populations of northern European origin. Accumulation of iron in the body is due to the inheritance of mutations in the HFE gene on both copies of chromosome 6. This leads to excessive absorption of iron from food. In the UK over 90% of patients with genetic haemochromatosis are homozygous for the C282Y mutation of the HFE.



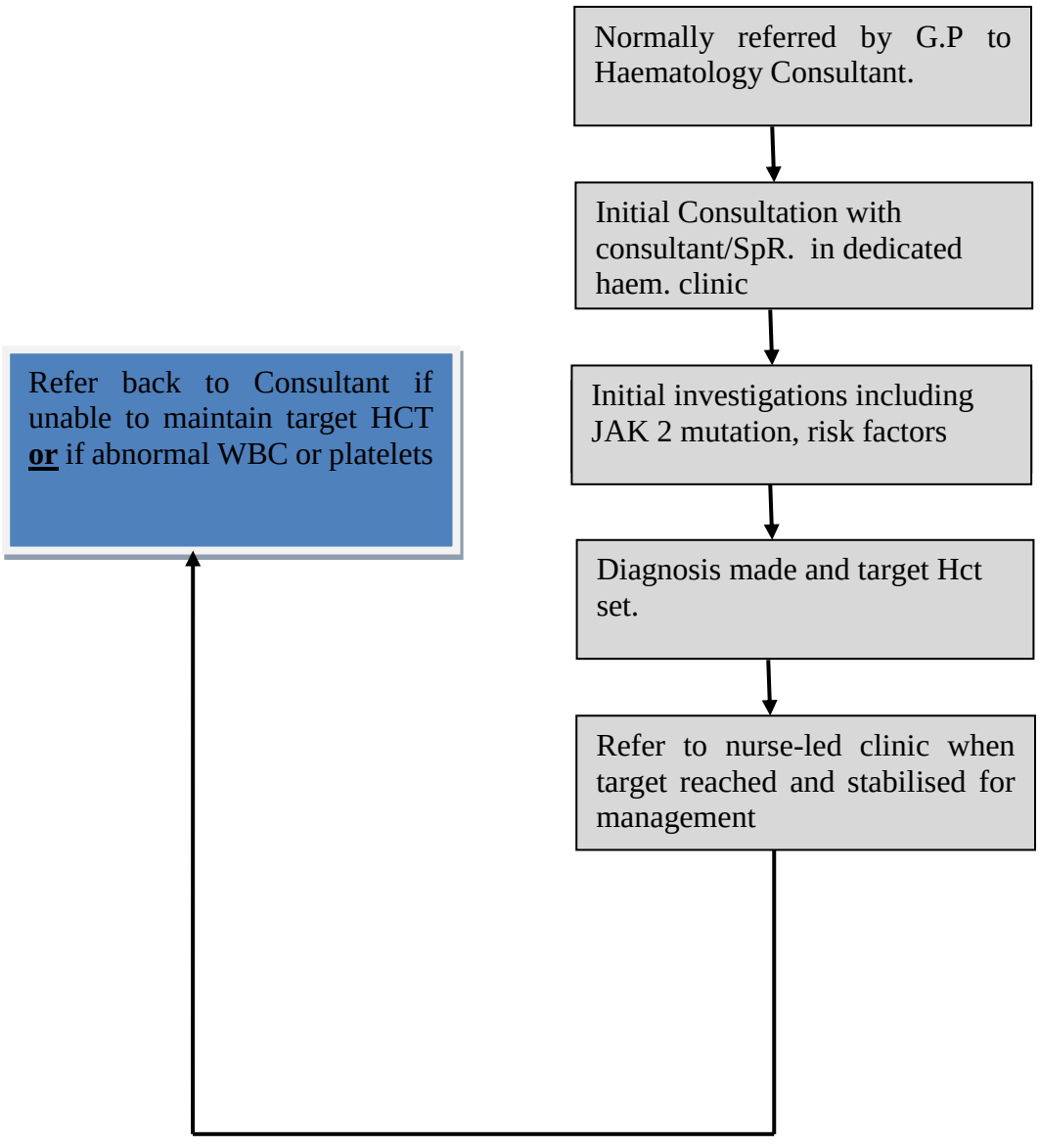
2. TRANSFUSIONAL IRON OVERLOAD

Iron overload due to multiple blood transfusions given to support the patient receiving chemotherapy.



PRIMARY/SECONDARY POLYCYTHAEMIA

Polycythaemia is a condition in which the Haematocrit is elevated. It can be due to an increase in the number of red blood cells (absolute polycythaemia) or a decrease in the volume of plasma (relative polycythaemia).
Absolute Polycythaemia may be due either to a primary process in the bone marrow called a myeloproliferative disorder. This is known as **Primary Polycythaemia.**
It may also be a reaction to a chronically low level of oxygen. This is known as **Secondary Polycythaemia.**
Relative polycythaemia is often due to a loss of body fluids from either dehydration, burns, medications or stress.



PATIENT REFERRAL FOR VENESECTION - POLYCYTHAEMIA

PATIENT DETAILS/ ADDRESSOGRAPH Name DOB Hospital No.	**CONSULTANT** **RELEVANT MEDICATION**
DIAGNOSIS	**GENETIC**
RISK FACTORS History of thrombosis Cardiovascular disease Lifestyle factors	**ASSOCIATED SYMPTOMS** **Headaches** **Visual disturbances** **Pruritis** **Fatigue** **Abdominal pain** **Other**
TARGET HAEMATOCRIT	**SPECIAL INSTRUCTIONS**
SUGGESTED FREQUENCY OF APPOINTMENT	**SUGGESTED DATE OF MEDICAL REVIEW**
Signature of referring consultant	Date

PATIENT REFERRAL FOR VENESECTION – HAEMOCHROMATOSIS

PATIENT DETAILS/ ADDRESSOGRAPH Name DOB Hospital No.	**CONSULTANT** **RELEVANT MEDICATION**
DIAGNOSIS	**GENETICS**
RISK FACTORS End organ damage	**ASSOCIATED SYMPTOMS**
TARGET IRON LEVELS Ferritin Transferrin Saturation	**SPECIAL INSTRUCTIONS**
	SUGGESTED DATE OF MEDICAL REVIEW
Signature of referring consultant	Date