IRON DEFICIENCY ANAEMIA IN PREGNANCY AND CHILDBIRTH

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Author and Job Title	Stephanie Pease (Midwife), Sue Hart (Midwife), Claire Atterbury (Transfusion Specialist Nurse), Jane Keidan (Consultant)
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Ratification Signatures: **Mr H Al-Taher: Co-Chair** **Mrs H Barnes: Co-Chair**	

IRON DEFICIENCY ANAEMIA IN PREGNANCY AND CHILDBIRTH

DEFINITION:

The British Committee for Standards in Haematology (BCSH) defines Iron Deficiency Anaemia (IDA) in Pregnancy as Haemoglobin (Hb) less than 11g/dl in the first trimester and less than 10.5g/dl in the second and third trimesters. The BCSH set the UK standard for haematological assessment for every pregnant woman. Breymann (2002) demonstrates the additional haematological values as the benchmark for assessment, diagnosis and management plan.

THE IMPLICATIONS TO MATERNAL HEALTH:

IDA is a significant complication, contributing to an overall adverse maternal outcome through the pregnancy, childbirth and the puerperium. The major symptoms of IDA are pallor, lethargy, and excessive fatigue, sleeping difficulties, dyspnoea, light headedness, dizziness and disorientation. There is a decrease in thermo-regulation and an increase susceptibility to infection.

IDA increases the risk of ante partum haemorrhage (APH), postpartum haemorrhage (PPH) and delayed healing of perineal trauma or caesarean section wounds. It also affects breast feeding, milk quality and quantity with lactation being interrupted or stopped as a result of the poor supply and excessive fatigue. However, routine iron supplementation is not recommended for all women in the UK.

THE IMPLICATION TO FETAL AND NEWBORN HEALTH:

The effects of IDA for the Fetus and the newborn are as significant as those for the mother; poor nutrient levels lead to poor uterine growth, decreased liquor, asymmetrical growth patterns, small for gestational age, premature delivery and low birth weight. Poor lactation leads to poor weight gain and failure to thrive, increasing the potential need for medical care and even hospitalisation.

BOOKING ASSESSMENT AND IDENTIFICATION OF IRON DEFICIENCY ANAEMIA:

During the booking appointment the Midwife must take a comprehensive medical, lifestyle and diet history; documenting problematic areas and developing (with the woman) a management plan for the duration of her pregnancy, through to the childbirth and postnatal period. The Midwife must give the 'Iron in Pregnancy' leaflet to all new pregnant women at booking. This must be documented in the hand held records.

A full comprehensive assessment of the woman's haematological profile is essential. Every effort should be made to ensure women have the routine blood analysis at booking and in readiness for the 28/40 and 34/40 pregnancy appointments. Blood result should be reviewed at the 14/40, 28/40 and 34/40 and should be within the normal range as per QEH laboratory assessment range (see table below):

NORMAL VALUES for FULL BLOOD COUNT IN ADULT FEMALE		
White Blood Cells	4-10	x10^9/L
Neutrophil	1.8 to 7.7	x10^9/L
Lymphocytes	1.5 to 3.5	x10^9/L
Monocytes	0.2 to 1.0	x10^9/L
Eosinophils	0.02 to 0.5	x10^9/L
Basophils	0.0 to 0.1	x10^9/L
Red Blood Cells	3.8 to 4.8	x10^12/L
Haemoglobin	12.5 to 16.5	g/dl
Haematocrit	0.36 to 0.46	L/L
MCV	81 to 99	fL
MCH	27 to 32	pG
MCHC	31.5 to 34.5	g/dl
Platelet Count	150 to 400	x10^9/L

Any deviation from these ranges should be reviewed, investigated and appropriate treatment commenced. Documentation of results and discussion regarding maternal health, dietary requirements and improving general food intake must be recorded in the hand-held records.

MANAGEMENT OF ANAEMIA: See flowcharts 1a-d and 2

AT BOOKING: **haemoglobin less than11g/dl=ANAEMIA. See flowcharts 1a-d**

At booking, the responsibility of reviewing the blood results lies with the midwife requesting them. If the FBC is within range, (see table above) general maternal health, dietary information and lifestyle discussions should be documented in the hand-held records. Plans should be discussed for routine 28/40 bloods to be taken prior to the appointment. If the blood results are abnormal use **flowcharts 1 a-d** to plan management, and treat accordingly. Any previous blood results could be used to establish a haematological profile and should be made available.

Women with a history of previous treatment for iron deficiency should have Ferritin levels checked, and should be given oral iron supplements if the current Ferritin is less than 30ng/ml

For women with anaemia and MCV less than 99 use **flowcharts 1a, 1b and 1c**. A repeat FBC should be taken 2 weeks after commencement of oral iron therapy. An increase of 1g/dl demonstrates effective treatment and compliance. Iron therapy should continue for at least three months, or until 34/40, whichever is the longer. Women should be counselled on the correct administration of iron to avoid adverse gastrointestinal side effects and maximise absorption.

This includes:

- Iron should be taken on an empty stomach
- Iron should be taken one hour before meals
- Iron should be taken with a source of vitamin C e.g. orange juice to maximise absorption
- Iron should not be taken with other medications or antacids or tea as this prevents absorption

Note: low MCV and MCH can occur due to thalassemia trait. The midwife must ensure that booking haemoglobinopathy screening has been performed.

Women should be counselled re place of delivery if iron deficiency persists. BCSH recommend Hb >10g/dl for home confinement, as evidence suggests an increased risk of PPH in iron deficient women.

Management of anaemia with MCV above 99 is outlined in flowchart 1d.

28/40 PREGNANT: haemoglobin less than 10.5 g/dl=ANAEMIA. See flowchart 2

If blood results show MCV and MCH values within normal haematological ranges BUT the Hb is less than 10.5g/dl, the woman should be advised to increase her intake of iron rich foods, ensure that she has been given the Iron In Pregnancy leaflet and be treated with Ferrous Fumerate 322mg BD. A management plan for rechecking her full blood count (FBC) should be made after two weeks of treatment, (BCSH guidelines) and then just prior to her 34/40 appointment. The management plan should be clearly documented in the hand-held record

A FBC which demonstrates a dropping Hb – less than 10.5g/dl, with either a dropping MCV – or a MCV less than 81fl, a dropping MCH – or MCH below 25 and a MCHC below 31.5 should be investigated fully (**See flowchart 2**).

Note: low MCV and MCH can occur due to thalassemia trait. The midwife must ensure that the booking haemoglobinopathy screening was performed.

If the blood results are abnormal, the Midwife must organise a further FBC, and measure Ferritin, Folate, Vitamin B12 and Iron studies and a further appointment be given for 1/52 to fully assess these results and make a management plan (see table below):

NORMAL VALUES	
Ferritin	Greater than 30 ng/ml
Serum Folate	Greater than 5.4 ng/ml
Red Cell Folate	Greater than 280 ng/ml
Vitamin B12	Greater than 246 pg/ml

Hb less than 11g/dl, low MCV pre-28/40 is treated with Ferrous Fumerate 322mg BD (if thalassemia has been excluded). An abnormal Red Cell Folate result (below 3ng/ml) should be treated with Folic Acid - 5 mg daily. Ensuring the B12 levels are measured and treated as failure to do so could lead to severe neurological disorders. An indeterminate B12 result – between 211-246pg/ml – requires repeat testing. If indeterminate result again, should be treated with Hydroxycobalamin 1mg/1ml for X1 dose, if below 211 pg/dl, treat with 6 doses of Hydroxycobalamin 1mg/ml alternate days over 2 weeks. B12 levels can fall in normal pregnancy in the absence of true B12 deficiency which would require life-long supplementation, so Vitamin B 12 levels should be checked 3 months postnatal and the results reviewed and further investigations / treated by the General Practitioner if low.

34/40 PREGNANT:
If the Hb is less than 10.5g/dl and/or a dropping MCV which does not respond to oral iron, treatment should be with administration of Intravenous Iron therapy – see protocol.

POSTNATAL TREATMENT AND MANAGEMENT PLAN

If Hb <10g/dl, or excessive blood loss at delivery, the woman will usually require iron therapy. The need for oral versus intravenous iron supplementation must be considered taking into account degree of anaemia, symptoms, social circumstances and likely compliance. Oral Ferrous Fumerate 322mg BD should be given for a minimum of 3 months post delivery to ensure stores are fully replenished, with the GP dispensing the treatment following initial treatment from the hospital. Iron

supplementation should continue for 3 months after the FBC has returned to normal to restock the body stores.

REFERENCES:

- Breymann, C. (2002) Iron deficiency and Anaemia in Pregnancy: Modern aspects of Diagnosis and Therapy Blood cells, Molecules and Disease, Vol 29, Issue 3, November 2002 Pages 506-516.
- Breymann, C. (2002) Iron Supplementation during Pregnancy, Fetal and maternal Medicine review; 13:1 1-29. Cambridge University Press.
- BCSH UK Guidelines on the Management of Iron Deficiency in Pregnancy, S. Pavord et al 2011 in press.

Flow Chart 1a – Anaemia at Booking

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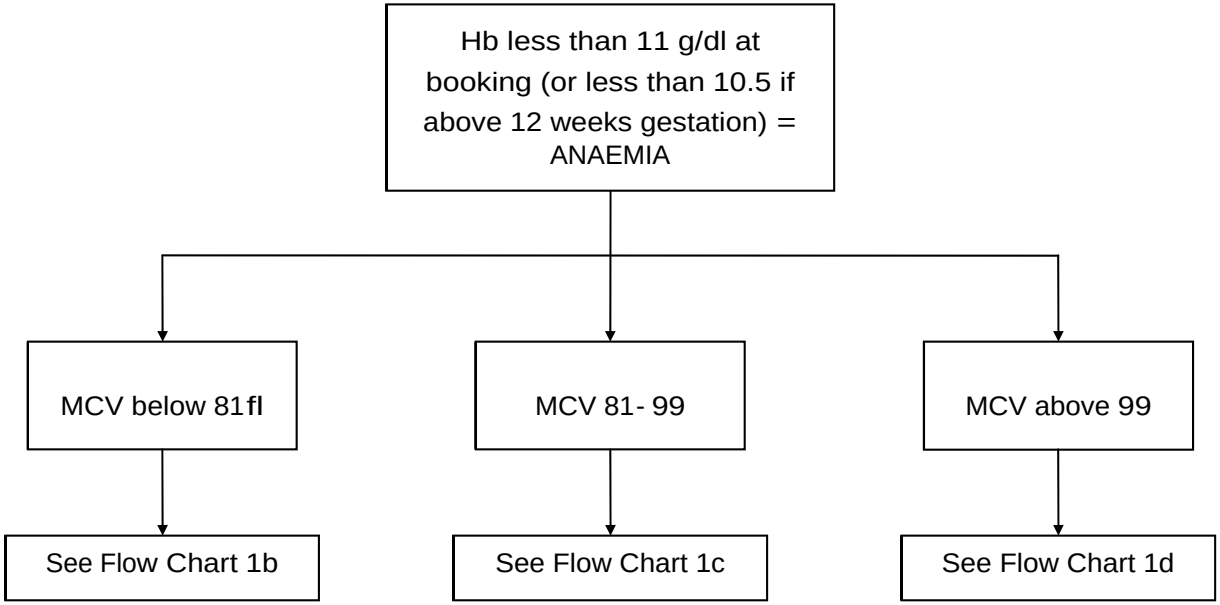

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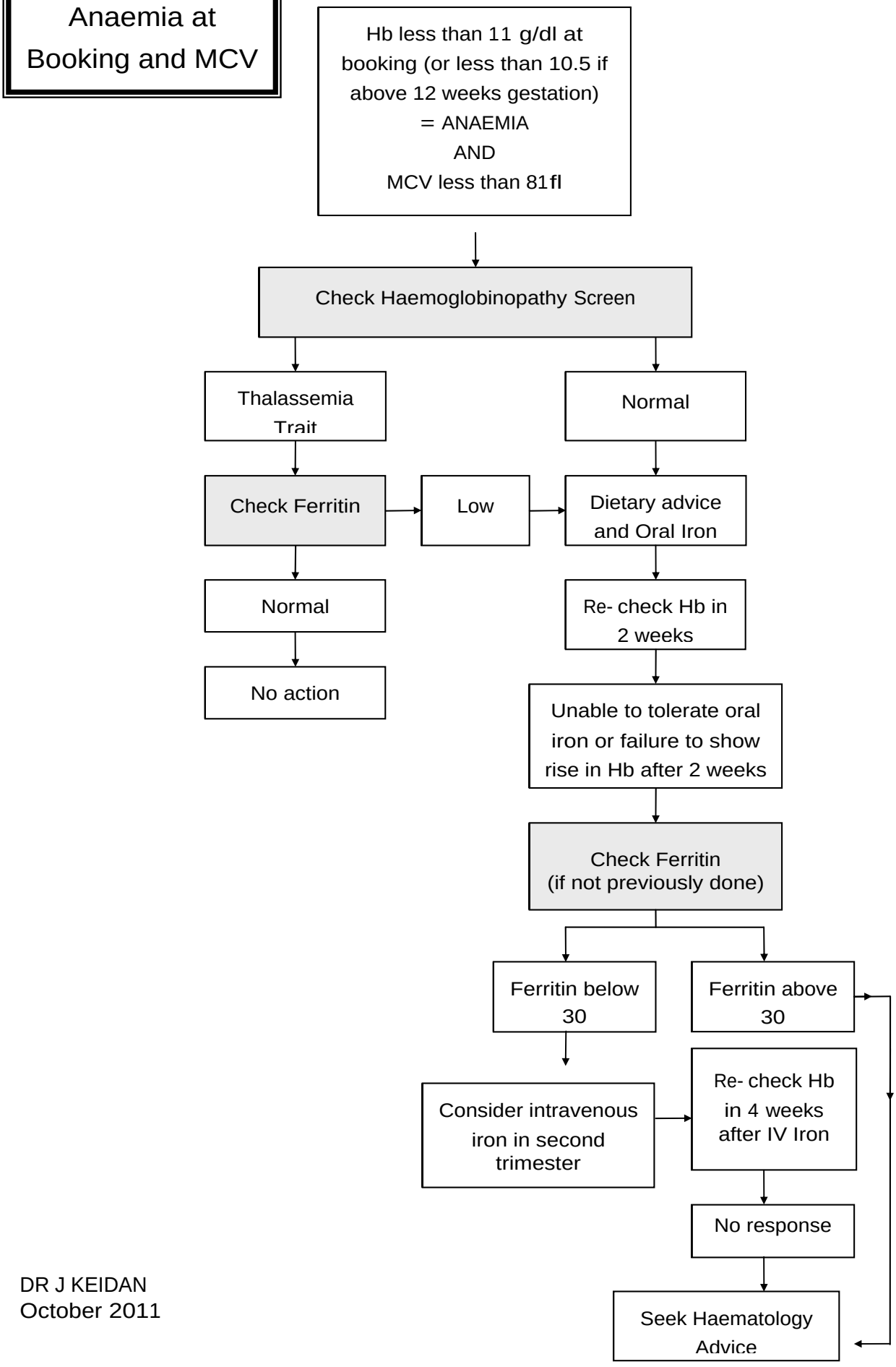
Flow Chart 1b – Anaemia at Booking and MCV



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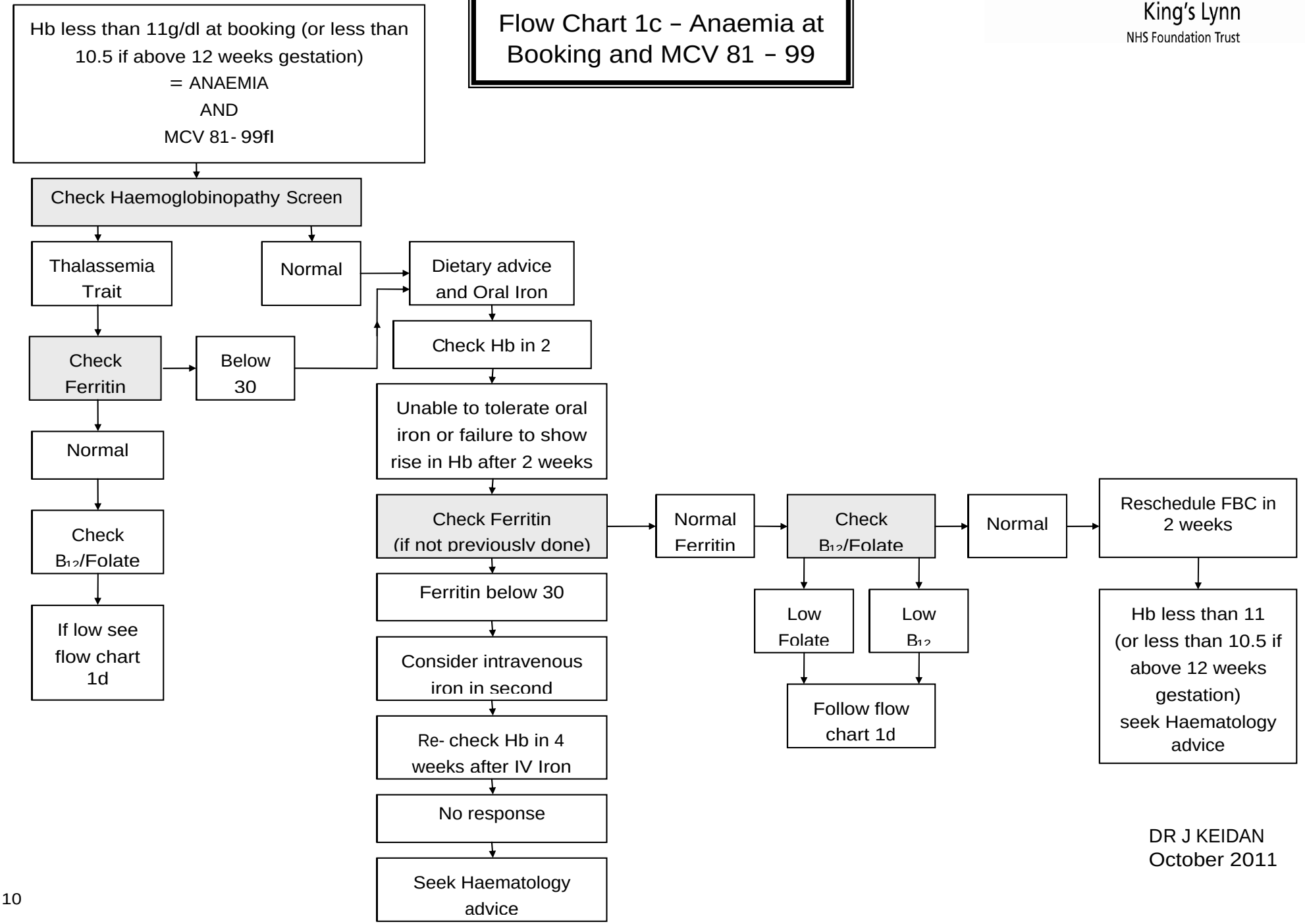
Flow Chart 1c – Anaemia at Booking and MCV 81 – 99



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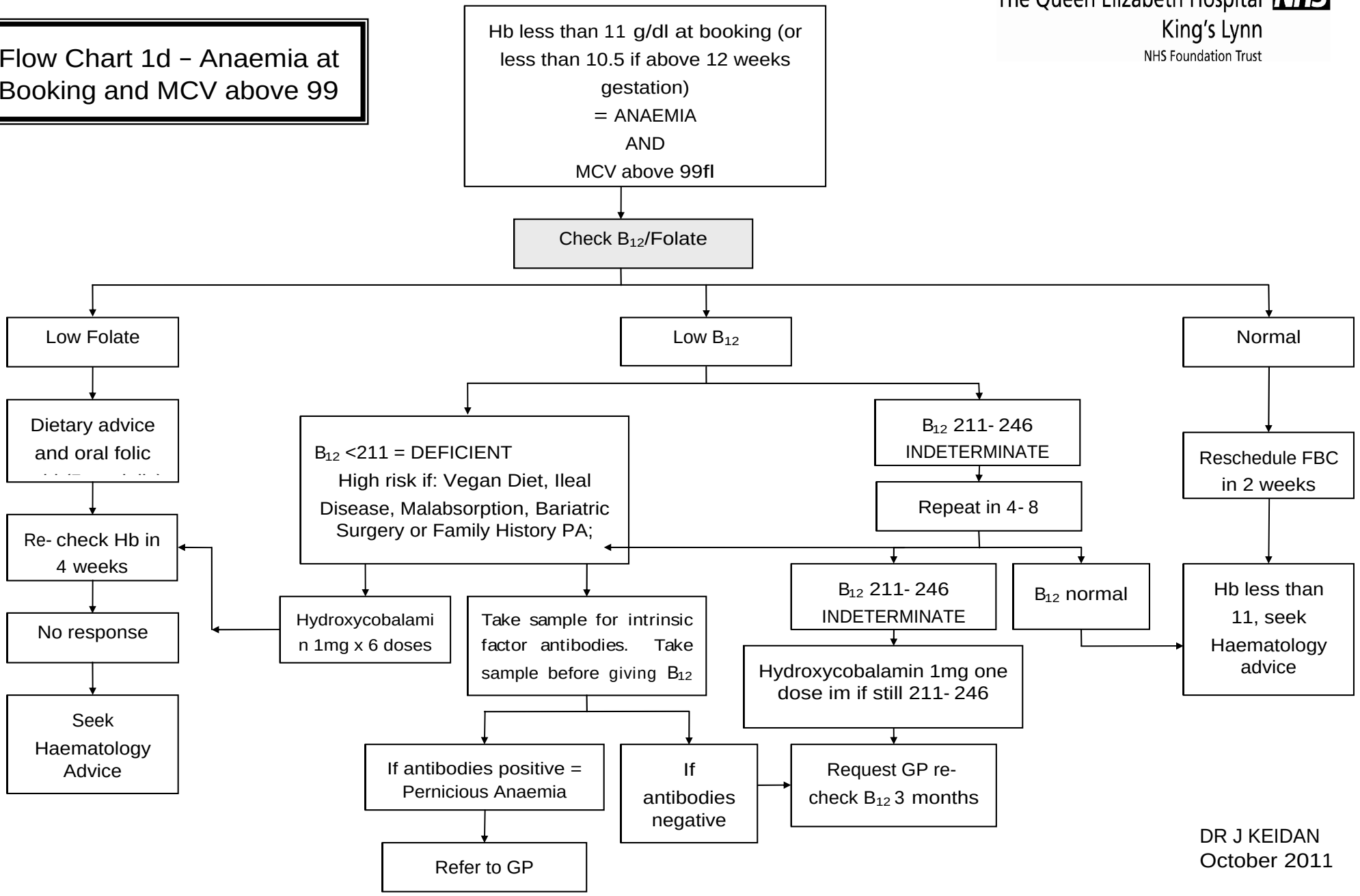
Flow Chart 1d – Anaemia at Booking and MCV above 99



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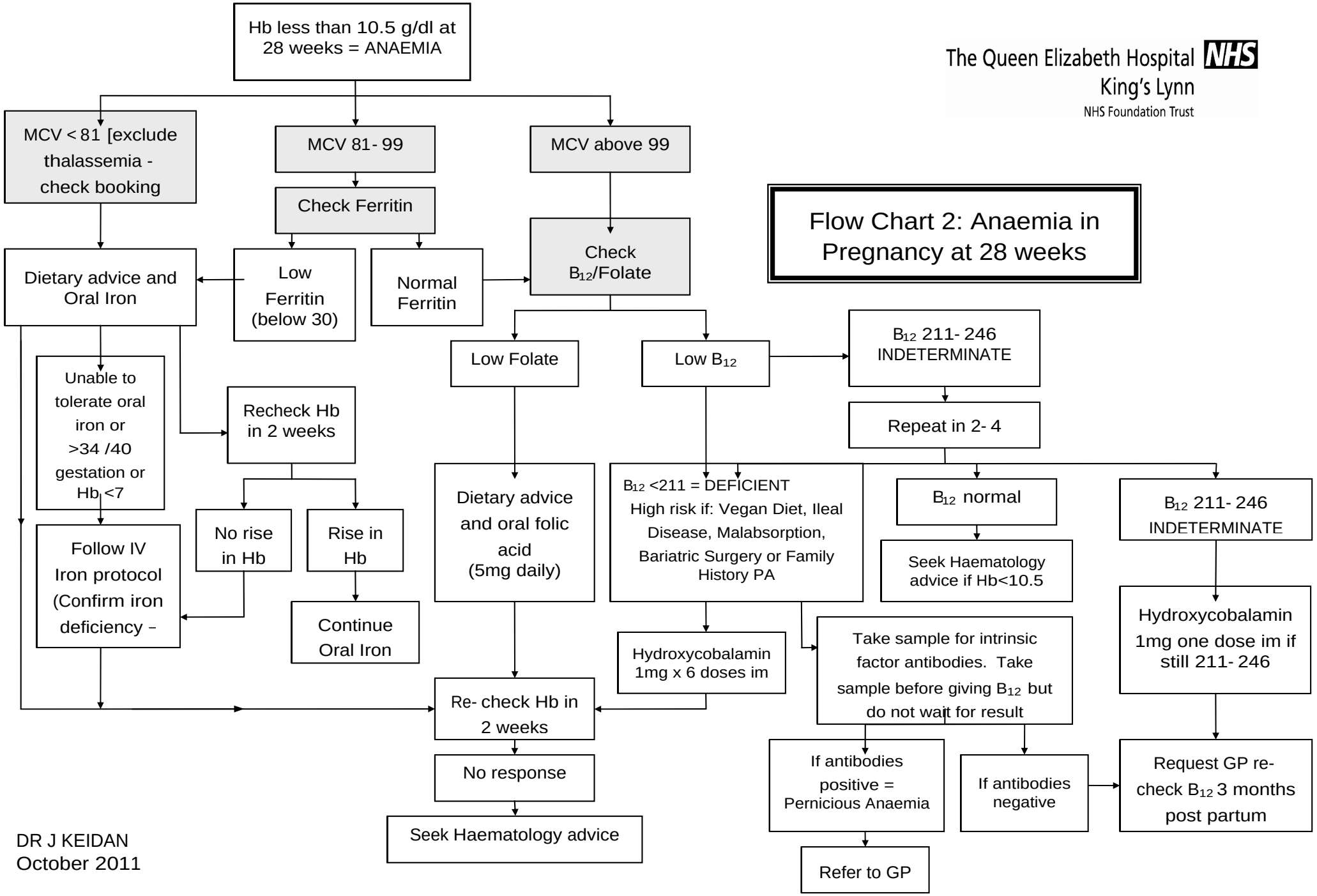

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