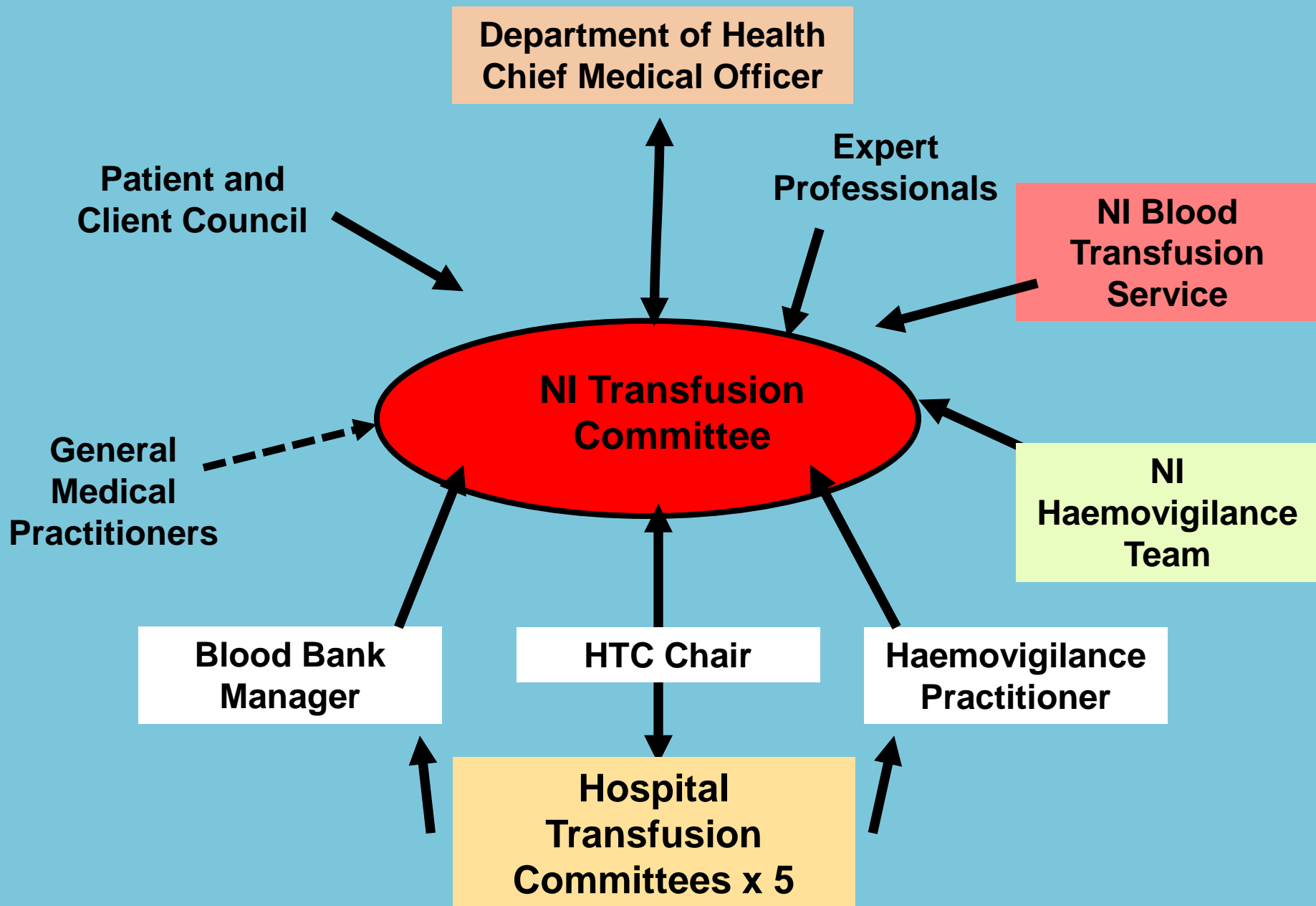


# Management of Anaemia reduces Red cell Transfusion in NI

Dr Susan Atkinson  
NI Transfusion Committee

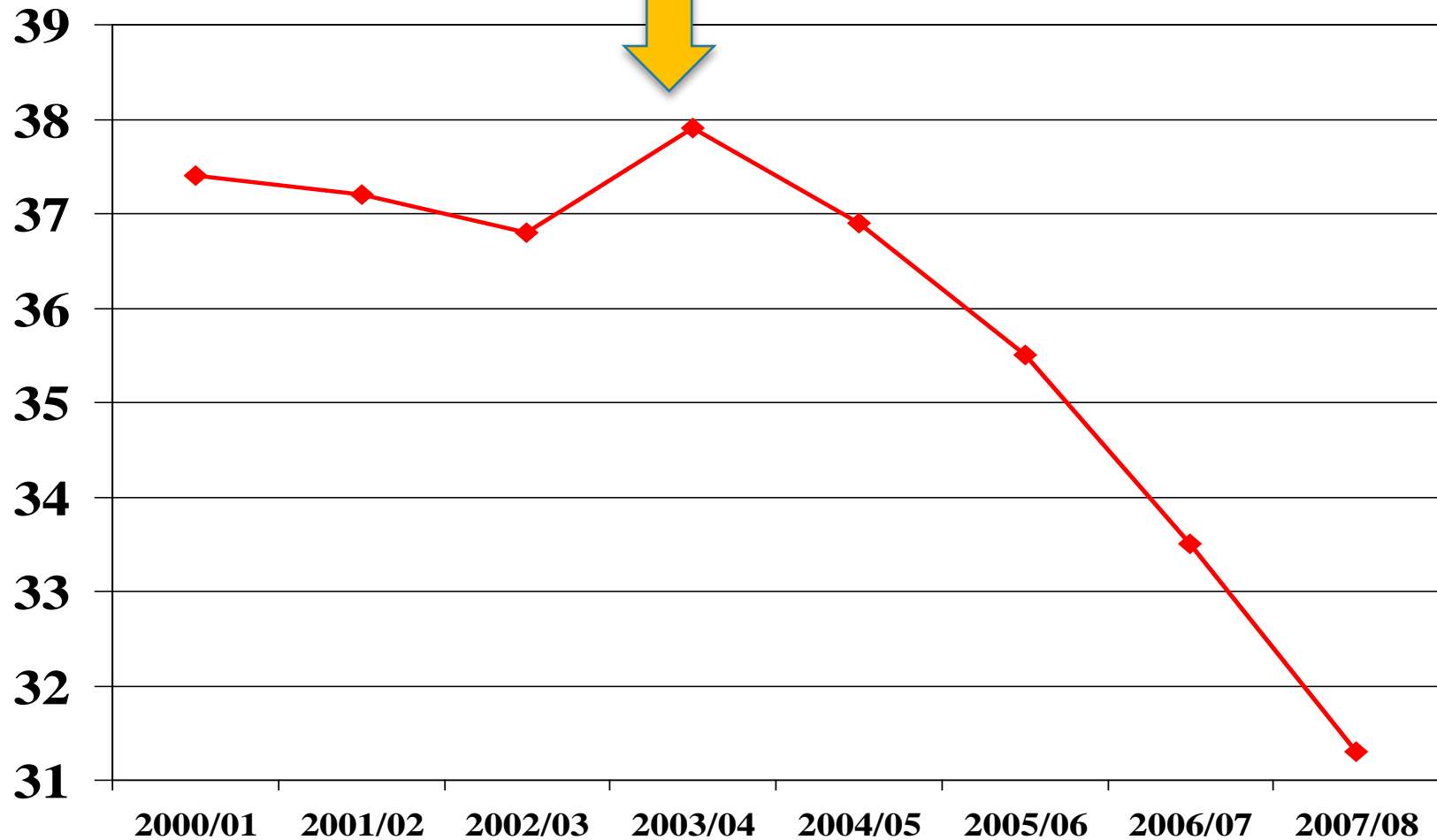


# NI Red Cell Issues

2000 – 2008

No. of Units per  
1000 population

**NITC**



# Regional Audit of Red Cell Transfusions 2004-2005

## Transfusion Triggers

Hb < 7 g/dl: < 65 yr, no CVS disease

Hb < 8 g/dl: > 65 yr, no CVS disease

Hb < 9 g/dl : CVS disease

Hb < 10 g / dl

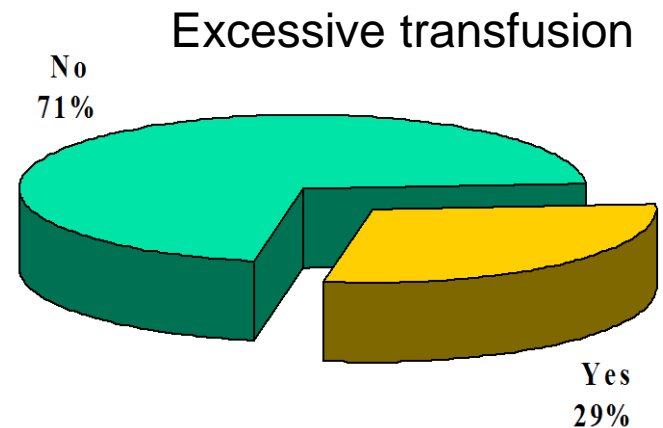
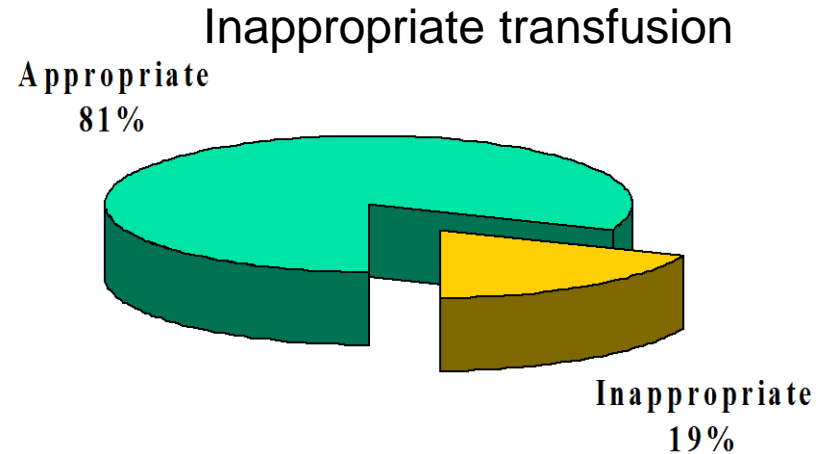
Bone marrow depression

Chemo or radiotherapy

Symptomatic of anaemia

Ongoing bleeding > 500 ml / hr

1220 transfusion episodes



# Audit Recommendations Endorsed

## DHSSPS 2006

From the Chief Medical Officer  
**Dr Michael McBride**



Department of  
**Health, Social Services  
and Public Safety**  
An Roinn  
**Sláinte, Seirbhísí Sóisialta  
agus Sábháilteachta Poiblí**  
[www.dhsspsni.gov.uk](http://www.dhsspsni.gov.uk)

To:

Medical Directors of Trusts – for transmission to all  
hospital doctors and doctors in Community  
Trusts who may prescribe blood transfusion.  
Directors of Nursing of Trusts – for attention of Nursing  
and Midwifery staff.

Castle Buildings  
Stormont Estate  
Belfast BT4 3SQ  
Tel: 028 90 520563  
Fax: 028 90 520574  
Email: [michael.mcbride@dhsspsni.gov.uk](mailto:michael.mcbride@dhsspsni.gov.uk)

Your Ref:  
Our Ref:  
Date: 17 November 2006

Dear Colleagues

### APPROPRIATE USE OF BLOOD IN NORTHERN IRELAND

You may remember that CREST guidelines on the use of blood in Northern Ireland were distributed in 2001. Following this, the Northern Ireland Regional Transfusion Committee undertook a major audit of red cell use in Northern Ireland<sup>1</sup>. This was supported by RMAG.

The results of this audit were presented at a Workshop earlier this year. It is fair to say that the results were disappointing, with a considerable proportion of blood use in Northern Ireland being judged inappropriate.

Because of the increased risk that blood transfusion now carries, not least the danger of communicable disease that has not yet been identified, and the fact that every recipient of blood is now automatically barred from ever donating blood, CREST has drawn up new guidelines on blood transfusion in adult patients, and these are currently out for consultation.

However, I wanted to draw your attention to the major points in the new guidelines, as quickly as possible.

#### Transfusion thresholds:

- For otherwise healthy patients less than 65 years of age a transfusion trigger of 7g/dl is appropriate.
- For otherwise healthy patients over 65 years of age a transfusion trigger of 8g/dl is appropriate.
- For otherwise healthy patients with additional risk factors of cardiac and cerebrovascular insufficiency, a higher trigger of 9g/dl is permitted.



The Northern Ireland Regional Transfusion Committee

# Regional Guidance 2009

**GAIN**  
GUIDELINES AND ALERT  
IMPLEMENTATION NETWORK

**BETTER USE  
OF BLOOD  
IN NORTHERN  
IRELAND**

**Guidelines for Blood  
Transfusion Practice**

March 2009

## Guidelines for Red Cell Transfusion (Adults)

### Wall Chart

- Always diagnose the cause of anaemia
- Treat reversible causes of anaemia

Stable Patients	Transfusion Threshold
< 65 years old with no cardiovascular or cerebrovascular problems.	Usually only consider transfusion when Hb < 7g/dl
> 65 years old with no cardiovascular or cerebrovascular problems.	Usually only consider transfusion when Hb < 8g/dl
Known cardiovascular or cerebrovascular history (previous myocardial infarction, angina, hypertension, heart failure, peripheral vascular disease pulmonary oedema).	Usually only consider transfusion when Hb < 9g/dl

Patients with symptoms due to anaemia Unstable patients bleeding heavily Impaired marrow function	Transfusion Threshold
Symptoms (dyspnoea, angina, palpitations, tachycardia, orthostatic hypotension, syncope) likely to be due to the anaemia.	Consider transfusion when Hb < 10g/dl
<i>Note - Tiredness alone is not an appropriate symptom for transfusion</i>	
Documented/obvious evidence of ongoing significant bleeding at time of transfusion causing symptoms as above or bleeding more than 500ml per hour and not stopping.	Consider transfusion when Hb < 10g/dl
Current or recent (within 3 months) marrow failure or chemotherapy or radiotherapy.	Consider transfusion when Hb < 10g/dl

Patients should only be transfused to a target of 2.0g/dl haemoglobin in excess of the chosen threshold for transfusion above.  
Consider patient's estimated blood volume and any ongoing bleeding.

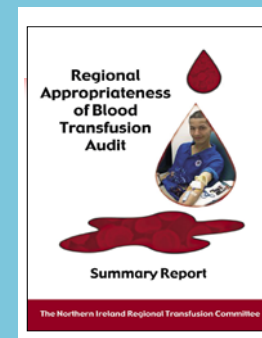
# Regional Blood Request Form

NI HOSPITAL TRANSFUSION REQUEST FORM																																																									
<p><b>PLEASE PRINT CLEARLY</b></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>SEAH-THA CASE NUMBER</p> <p>HOSPITAL No.</p> <p>SURNAME</p> <p>FIRST NAME</p> <p>PATIENT POSTCODE</p> <p>CONSULTANT</p> <p>LABORATORY COMMENTS</p> </div> <div style="width: 15%;"> <p>(GIVE CAPITALS PLEASE)</p> <p>DATE OF BIRTH</p> <p>SEX <input type="checkbox"/> M <input type="checkbox"/> F</p> <p>HOSPITAL</p> </div> <div style="width: 20%;"> <p>DATE OF SPECIMEN</p> <p>TIME OF SPECIMEN</p> <p>RELATE <input type="checkbox"/></p> </div> <div style="width: 20%; border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #e0ffe0;">FOR LABORATORY USE ONLY</p> </div> </div>																																																									
<p><b>SAMPLE MUST BE HAND WRITTEN AND SIGNED</b></p> <p><b>ADDRESSOGRAPH ACCEPTABLE ON FORM</b></p> <p style="text-align: right; background-color: #e0ffe0; padding: 5px;">STICK CAT 3 HAZARD STICKER HERE</p>																																																									
<p><b>TRANSFUSION HISTORY &amp; TEST REQUEST</b></p>																																																									
<p>Blood Group (if known) _____ Atypical Antibodies (if known) _____</p> <p>Previous transfusions Yes <input type="checkbox"/> No <input type="checkbox"/> If Yes: date of most recent transfusion _____</p> <p>Previous reactions Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Previous pregnancies Yes <input type="checkbox"/> No <input type="checkbox"/> Anti-D given recently (&lt;12 weeks) Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Group &amp; Antibody screen (held for 7 days) <input type="checkbox"/> Direct Antiglobulin Test (Coombs Test) <input type="checkbox"/> Kleihauer Test <input type="checkbox"/></p> <p>I confirm that the patient identification details correspond to the details of the patient and the sample tube.          Within the last 3 years I am certified as competent in core competency in obtaining a venous sample for pre transfusion testing.</p> <p>Sample taken by (holding Staff Group) <span style="background-color: #ffe0e0; padding: 2px 10px;">PRINT</span> _____ Signature _____ Date _____</p> <p>The above section <b>MUST BE</b> signed by the person taking the sample, failure to do so will result in the sample being rejected.</p>																																																									
<p><b>PRODUCT REQUEST</b></p>																																																									
Components		Red Cells	Platelets	FFP	Cryo.	Other Product Requests																																																			
No. of Units																																																									
<p><b>SPECIAL REQUIREMENTS</b></p>																																																									
<p>CMV neg (CMV) <input type="checkbox"/> Irradiated (IRR) <input type="checkbox"/> Methylene Blue Treated <input type="checkbox"/></p>																																																									
<p>Required for: Date _____ Time _____ Deliver to _____</p> <div style="display: flex;"> <div style="width: 50%; background-color: #f2f2f2; padding: 5px;"> <p><b>INDICATION FOR RED CELL TRANSFUSION</b> ✓</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Age &lt; 65 years Hb &lt; 7g/dl</td><td></td></tr> <tr><td>Age &gt; 65 years Hb &lt; 8g/dl</td><td></td></tr> <tr><td>Cardiac / cerebrovascular symptoms Hb &lt; 8g/dl</td><td></td></tr> <tr><td>Significant haemorrhage &gt; 500ml / hour</td><td></td></tr> <tr><td>Bone Marrow failure syndromes Hb &lt; 10g/dl</td><td></td></tr> <tr><td>Patient on Chemol/ Radiotherapy Hb &lt; 10g/dl</td><td></td></tr> <tr><td>Symptomatic of anaemia, Hb &lt; 10g/dl*</td><td></td></tr> <tr><td>Massive Transfusion protocol (Please contact blood bank immediately)</td><td></td></tr> </table> </div> <div style="width: 50%; padding: 5px;"> <p>Surgery: state operation / MSBOS below</p> <p>FFP, Platelets, Cryo: state reason for request</p> <p>Most recent Hb result &amp; date</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">g/dl</td> <td style="width: 10%;">•</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> </div> </div>												Age < 65 years Hb < 7g/dl		Age > 65 years Hb < 8g/dl		Cardiac / cerebrovascular symptoms Hb < 8g/dl		Significant haemorrhage > 500ml / hour		Bone Marrow failure syndromes Hb < 10g/dl		Patient on Chemol/ Radiotherapy Hb < 10g/dl		Symptomatic of anaemia, Hb < 10g/dl*		Massive Transfusion protocol (Please contact blood bank immediately)		g/dl	•																												
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<p>Requested by (holding Staff Group) <span style="background-color: #ffe0e0; padding: 2px 10px;">PRINT</span> _____ Signature _____</p> <p>Product requests will not be processed unless the above section is completed and signed          For emergency requests, FFP, Platelets or Cryoprecipitate please telephone / fax blood bank.</p> <p style="text-align: center; background-color: #f2f2f2; padding: 5px;"><b>see front cover for blood bank contact details</b></p>																																																									

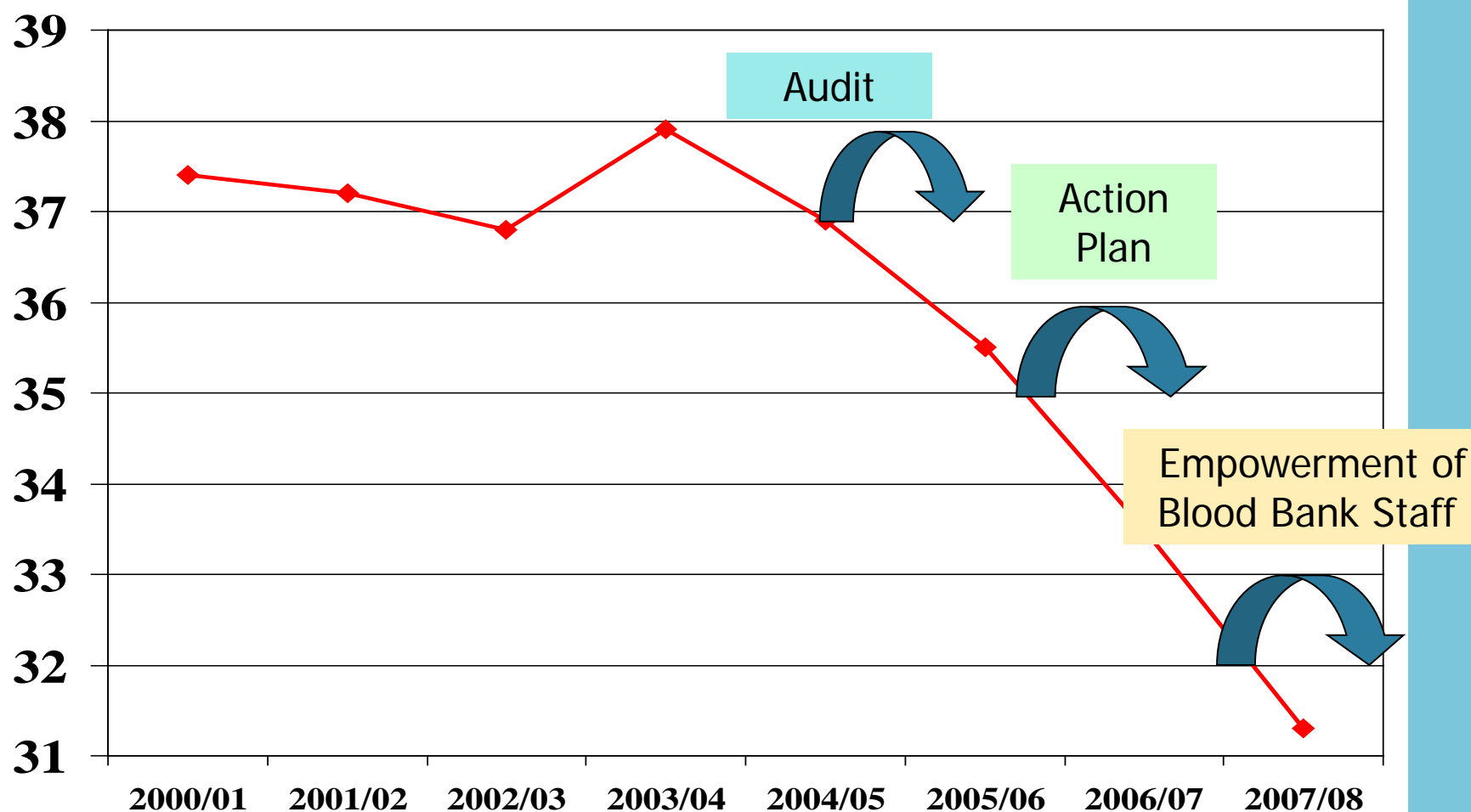
- **Zero tolerance**
- **Indication for transfusion**



# NI Red Cell Issues 2000 – 2008



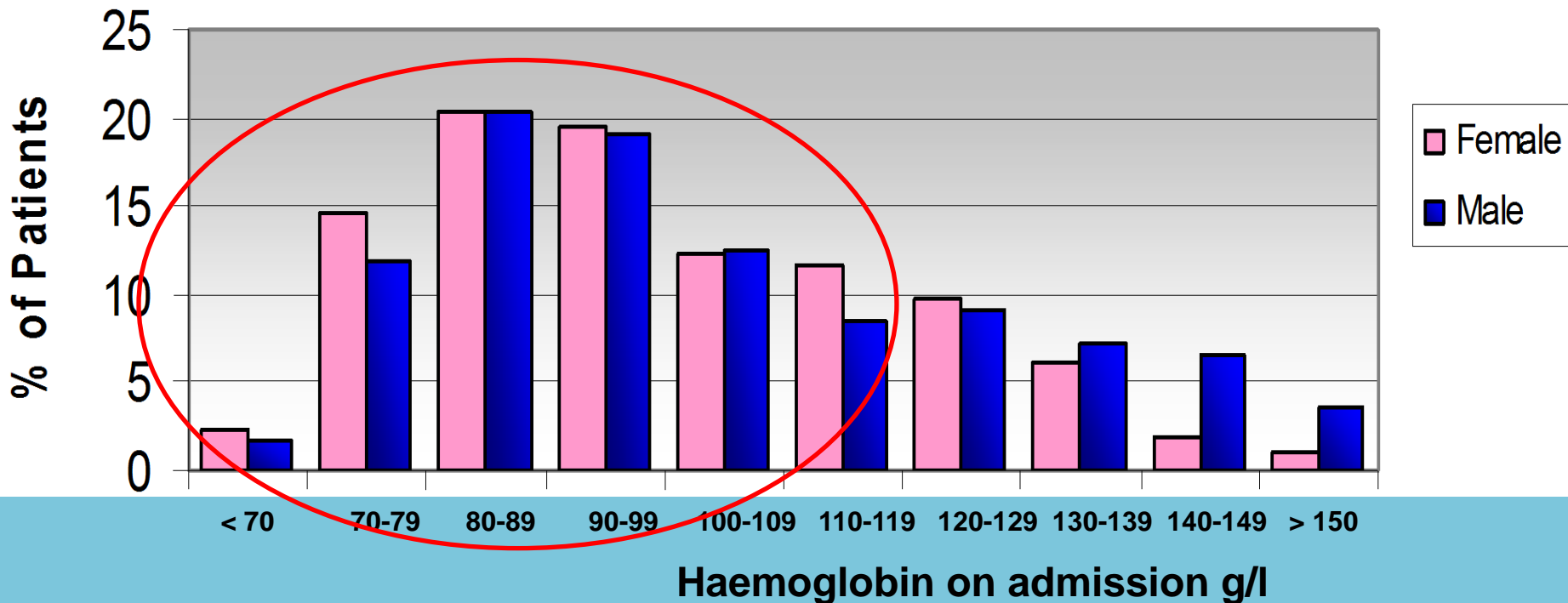
No. of Units per  
1000 population





# Haemoglobin at time of Hospital Admission

Regional audit 2004 - 2006



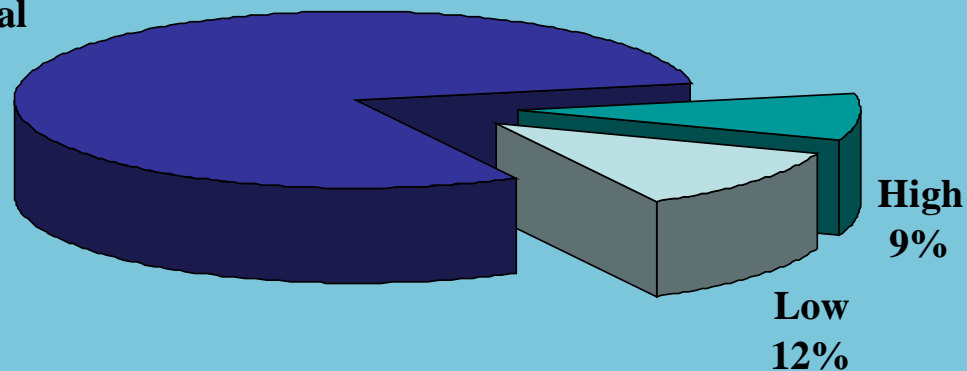
> 85% Anaemic

WHO Definition of anaemia

Adult female < 120 g/l

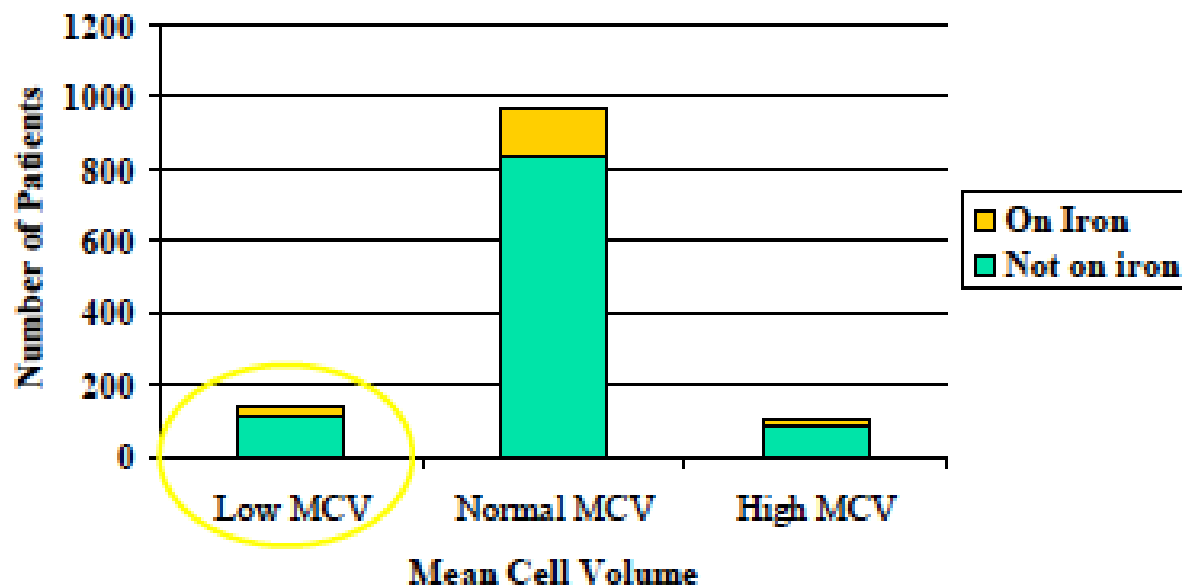
Adult male < 130 g/l

**Normal**  
**79%**

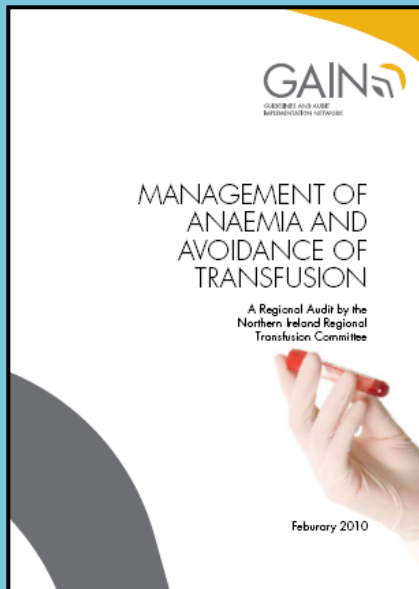


**MCV**

## Iron Therapy



# Regional Audit of Anaemic patients



743 anaemic patients, 16 yr and older  
Transfused in 2007

Retrospective review of patients' notes laboratory  
reports, outpatient letters, discharge summaries

**Was anaemia identified?**

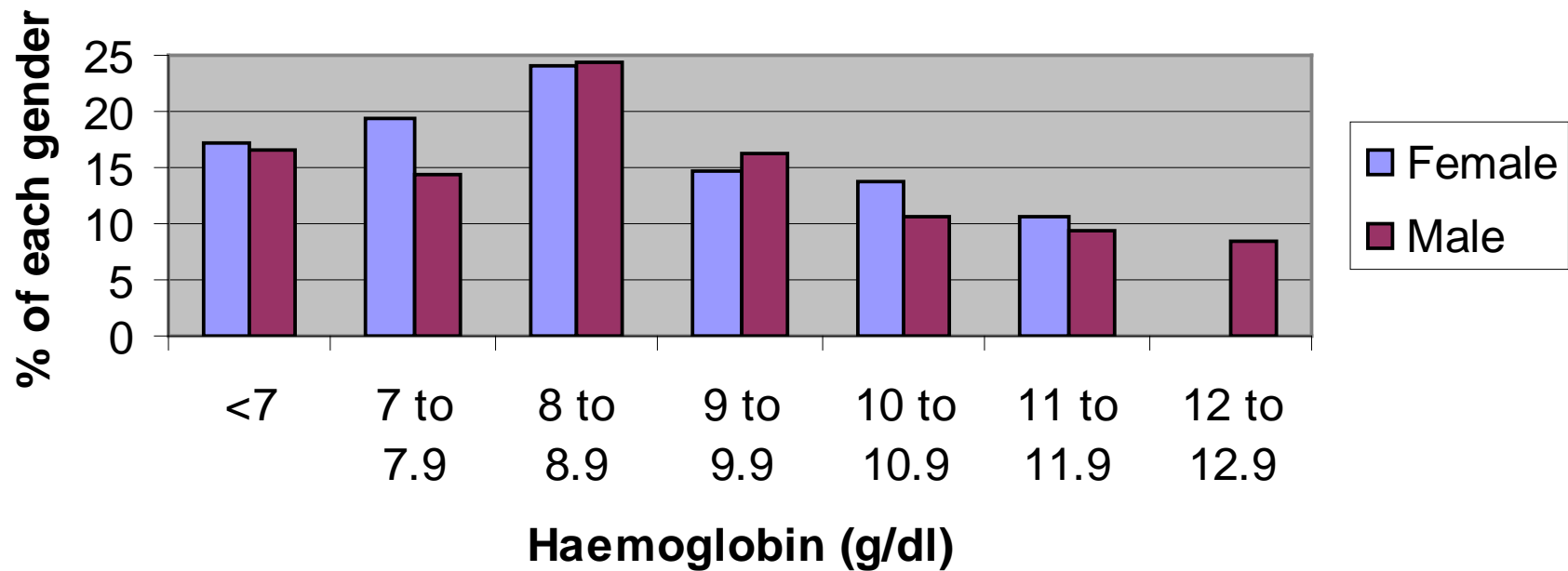
**Was anaemia investigated and diagnosed?**

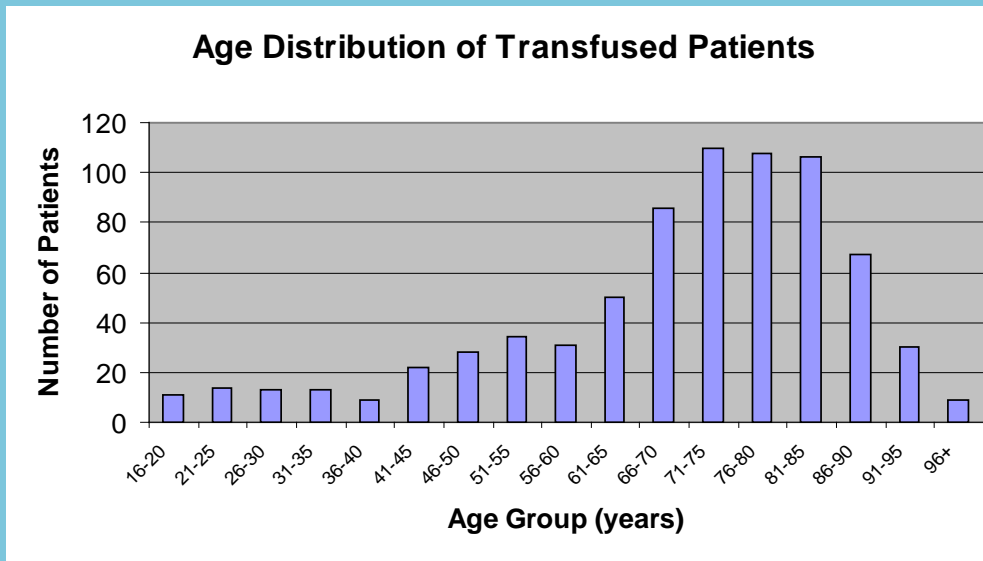
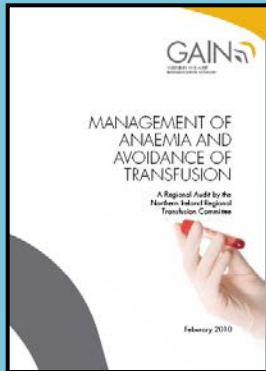
**Was anaemia treated appropriately?**

# Haemoglobin on admission

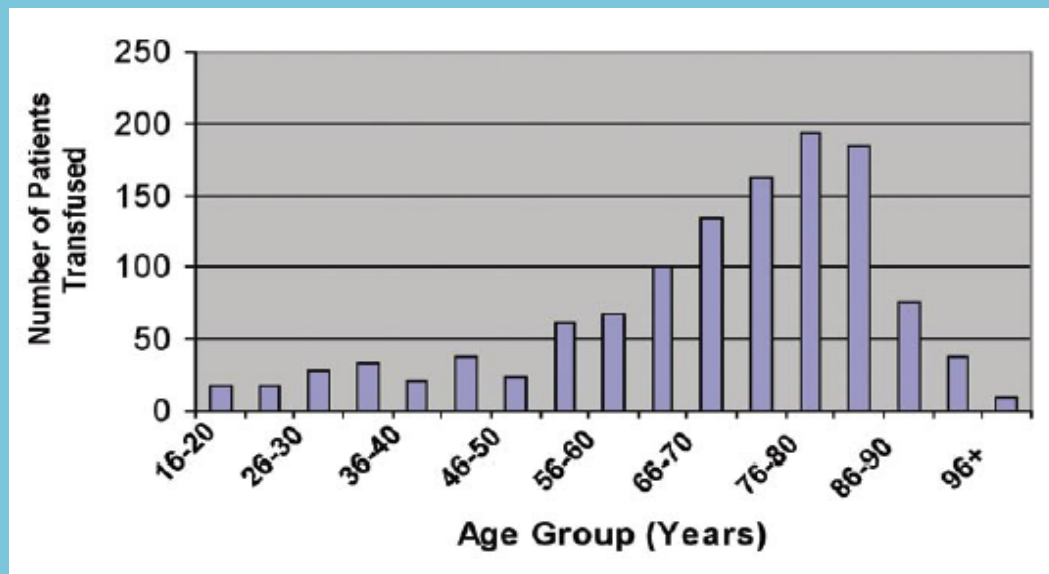
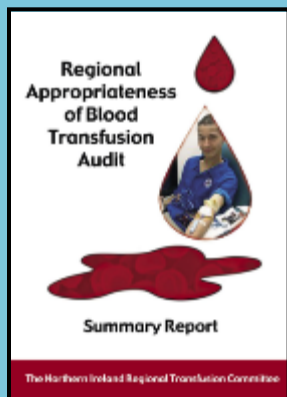


## Transfused Patients - Haemoglobin on Hospital Admission by Gender





Mean 69 years  
Median 73 years

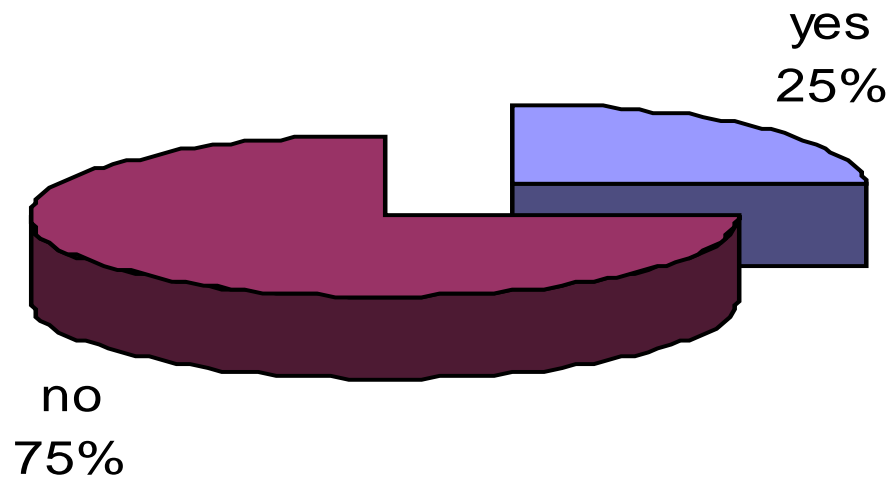


Mean 68 years  
Median 72 years

# Regional audit of Anaemia

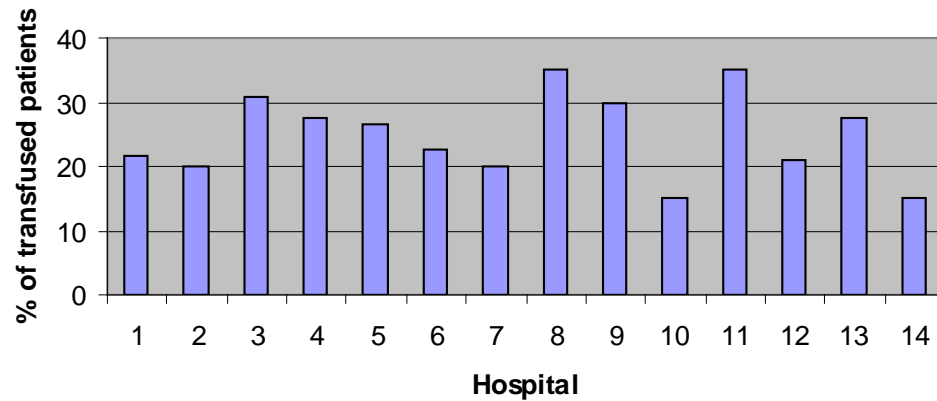
## Could transfusion have been avoided?

743 Patients

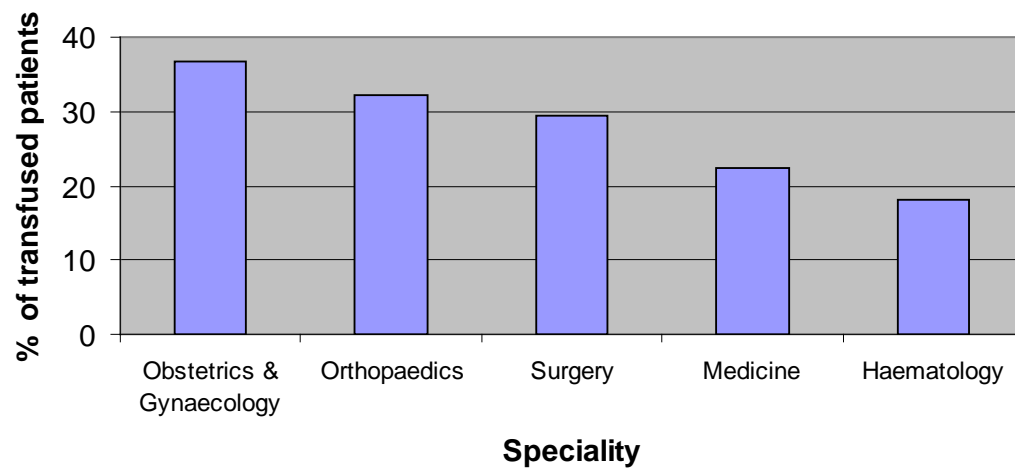


# Avoidable Transfusions

**Avoidable transfusion by hospital**

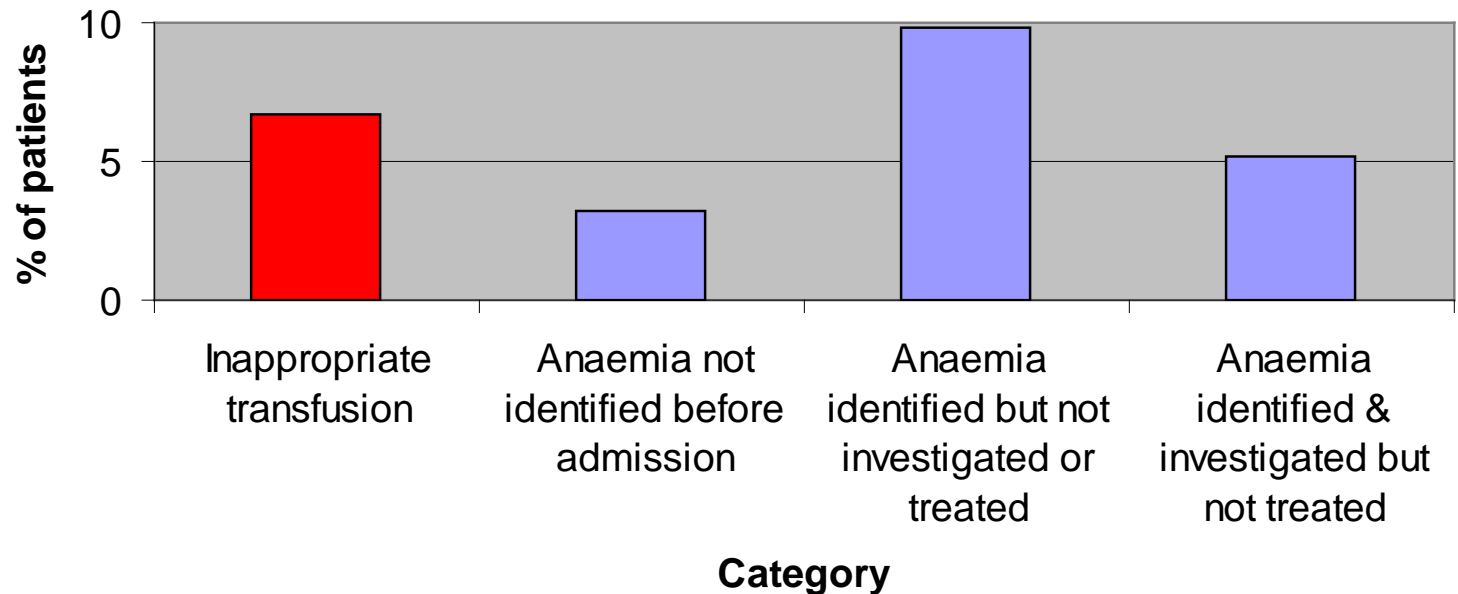
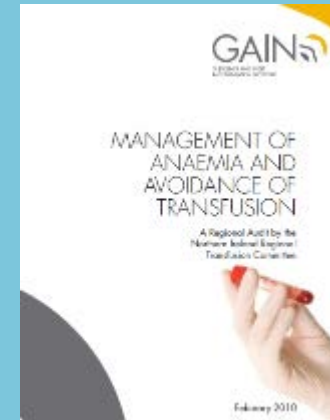
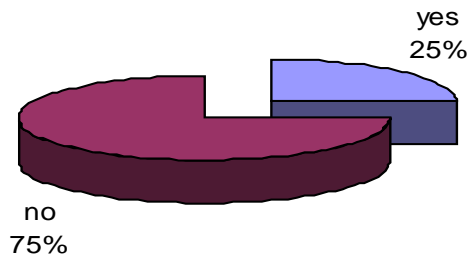


**Avoidable transfusion by admitting speciality**



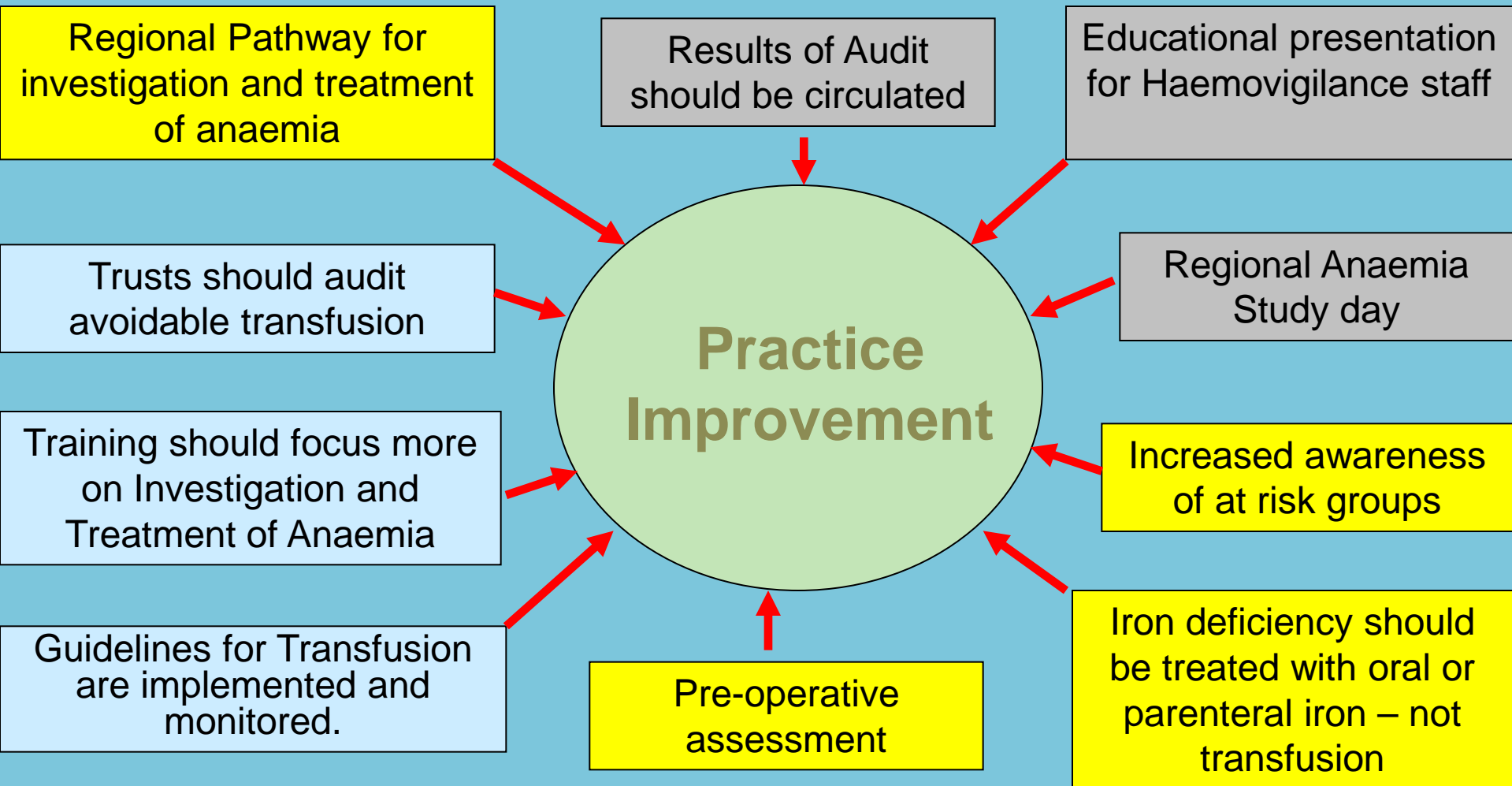
# Regional audit of Anaemia

## Could transfusion have been avoided?





# Action Plan



***“Anaemia: Old Problem, New Focus”***  
**When and How should we treat Anaemia  
 In Primary and Hospital Care**

Thursday 25 February 2010 (09.45 – 16.00hr)  
 Malone House  
 Belfast

TIME	PRESENTATION	SPEAKER
09.45	Anaemia – an old problem: Historic Perspective	Prof M Murphy Cons Haematologist
10.00	Anaemia and the Patient with Ischaemic Heart Disease	Dr H Gilliland Cons Anaesthetist
10.20	Anaemia in Pregnancy	Dr Shubha Allard Cons Haematologist
10.30	Anaemia in the Critical Care Patient	Dr D McAuley Cons Anaesthetist
10.50	Rehabilitation of the Elderly Anaemic Patient	Dr G Heyburn Ortho Geriatrician
11.10	Discussion	
11.15	Coffee	
11.45	What do “Iron studies and other Laboratory tests tell us?	Mr T McFarland Senior Biomedical Officer
12.05	How does the body handle iron?	Dr Nicole Pridge SpR Haematology
12.25	Investigation of Anaemia by the Gastroenterologist	Dr S Johnston Cons Gastroenterologist
12.45	Investigation and management of non iron deficiency anaemia	Dr G Benson Cons Haematologist
13.05	Discussion	
13.10	Lunch	
14.00	Preoperative Optimisation of Haemoglobin and Iron stores	Dr Craig Taylor Cons Haematologist
14.20	Haemoglobin and the Pre-assessment Clinic Experience	Ms Lynn Jones Pre-assessment nurse
14.40	Pre transfusion anaemia – Preventable Transfusion Audit report	Dr D Carson Cons Anaesthetist
15.00	Discussion session: When and how to treat anaemia: scoping exercise for regional guidance	Dr S Atkinson
15.30	Meeting close	

# Better Blood Transfusion 3 NI

## Improving the safety of blood transfusion



- Circulated to HSC Trusts  
- Aug 2011
- Interim self assessment  
- Dec 2011
- Final assessment  
- Sept 2012



**For action:**

Chief Executive of HSC Trusts for distribution to:

- Medical Directors
- Directors of Nursing
- Chairs of Transfusion Committees
- Hospital Blood Banks
- Consultant Haematologists
- Haemovigilance Practitioners

Chief Executive, RQIA for distribution to:

- Independent Hospitals, Hospices and agencies providing blood transfusions

Chief Executive, HSC Board for distribution to:

- Director of Performance Management and Service Improvement

Castle Buildings

Stamont

BELFAST

BT4 3SQ

Tel: 028 9052 0563

Fax: 028 9052 0574

Email: [michael.mcbride@dhsspsni.gov.uk](mailto:michael.mcbride@dhsspsni.gov.uk)

Our Ref: HSS(MD) 17/2011

Date: 24 August 2011

### **3. Reduction in Patient Requirement for Components or Products from Donated Blood**

- 3.1 Trusts should promote early detection of anaemia. They should develop and implement local policies and procedures for the identification, investigation and treatment of anaemia (See GAIN guidance 2010, Management of Anaemia and Avoidance of Transfusion).
- 3.2 The NIRTC must develop regional guidance for the detection and management of anaemia, including the process of optimisation of haemoglobin prior to scheduled surgery.
- 3.3 Healthcare Staff who work in pre-assessment clinics should liaise with Healthcare Professionals in primary care and hospitals to correct iron deficiency anaemia and optimise haemoglobin and haemostasis prior to scheduled surgical or other invasive procedures.

# Management of Anaemia

## 4 – Step approach

### 4 STEPS IN THE INVESTIGATION AND MANAGEMENT OF THE ADULT PATIENT WITH ANAEMIA

#### STEP 1

Test full blood picture for Haemoglobin (Hb) and mean corpuscular haemoglobin (MCV)

If Hb below normal range follow steps below

#### STEP 2

MCV low - perform iron studies (including serum ferritin)

MCV normal range - check iron studies, renal function, serum folate and vitamin B12 levels

MCV high - check liver function tests, thyroid function, serum folate and vitamin B12 levels

#### STEP 3

1. Start appropriate corrective therapy for anaemia without delay (e.g. oral iron therapy)

AND

2. Investigate cause of anaemia unless already known or further investigation is not in patient's best interests (e.g. palliative care only)

#### STEP 4

1. Monitor response to corrective therapy for anaemia, including rise in Hb

AND

2. Treat the cause of anaemia (e.g. surgery for carcinoma of bowel)

#### WHO Classification of anaemia

Haemoglobin: < 13 g/dl in adult male  
< 12 g/dl in adult female  
< 11 g/dl in pregnancy

#### Abbreviations used:

CRP: C-reactive protein

TIBC: total iron binding capacity

TSAT: transferrin saturation

LFTs: liver function tests

ESA: erythrocyte stimulating factor or recombinant erythropoietin

eGFR: estimated glomerulofiltration rate

**Sickle cell disease** – perform Sickledex test if positive family history or patient's genetic origin is West Africa

## MICROCYTIC ANAEMIA

### STEP 1

- Full Blood Picture Test

**\*\*MCV < 76fl or MCH < 27pg**  
Microcytic anaemia

**\*\*Normal range values may differ between hospital laboratories**

### STEP 2

- Iron studies (include se ferritin and TIBC)
- CRP

Se ferritin < 30 mcg/l when CRP < 30 mg/l  
Se ferritin < 70 mcg/l when CRP > 30 mg/l  
TIBC increased

Manage as IRON DEFICIENCY ANAEMIA

Se ferritin > 70 mcg/l, CRP normal or increased  
TIBC normal or decreased

Go to STEP 3

### STEP 3:

- Correct anaemia
- Investigate cause if unknown (unless further investigation not in patient's best interests)

#### IRON DEFICIENCY ANAEMIA

a) Start oral iron therapy to normalise Hb and replenish iron stores

Start with parenteral iron therapy if:

- History of oral iron intolerance or poor compliance
- Impaired gastrointestinal absorption
- Haemodialysis
- Major surgery must take place in < 3 weeks

b) Review history & examination for source of chronic bleeding

Refer to gastroenterologist if

- Adult male
- Postmenopausal female
- Premenopausal female with gastro-intestinal symptoms or bleeding

*NB – oral iron therapy must be suspended for 1 week prior to colonoscopy*

Refer to gynaecologist if

- Post menopausal bleeding
- Menorrhagia

#### MICROCYTIC ANAEMIA NOT DUE TO IRON DEFICIENCY

Assess for acute or chronic inflammatory disease, chronic infection, malignancy and liver disease – check differential WCC, LFTs

If thalassaemia or sideroblastic anaemia suspected or cause of anaemia unknown refer to a haematologist

### STEP 4:

- Monitor response to replacement therapy
- Treat disease causing the anaemia

INVESTIGATE

#### IRON DEFICIENCY ANAEMIA

Perform FBP after 3 weeks of iron therapy

If improvement in Hb (10-20 g/l increase):

- Check if Hb normalised after 2-4 months iron therapy
- Continue iron therapy for another 3 months to replenish iron stores

If no improvement, consider:

- Switch to parenteral iron therapy

NAB

#### ANAEMIA OF CHRONIC DISEASE

A diagnosis of exclusion

Unresponsive to parenteral iron unless iron deficiency also present

Treat and monitor the underlying cause

## NORMOCYTIC ANAEMIA

- STEP 1**
- Full Blood Picture Test

- STEP 2**
- Iron studies (include se ferritin + TIBC)
  - Se folate and vitamin B12
  - Urea, creatinine, eGFR

- STEP 3:**
- Correct anaemia
  - Investigate cause if unknown

- STEP 4**
- Monitor response to replacement therapy
  - Treat disease causing the anaemia (if appropriate)

\*\*MCV 76 - 100 fl  
MCH 27-32pg  
Normocytic anaemia

\*\*Normal range values may differ between hospital laboratories

Se ferritin < 30 mcg/l when CRP < 30 mg/l  
Se ferritin < 70 mcg/l when CRP > 30 mg/l  
TIBC increased

Treat as IRON DEFICIENCY ANAEMIA  
See STEP 3 for microcytic anaemia

Se ferritin > 30 mcg/l \*\*\*  
TIBC decreased  
Normal vitamin B12 level  
Low or normal se folate level

Se creatinine high, eGFR < 60 ml/min

**CHRONIC KIDNEY DISEASE**

**CHRONIC KIDNEY DISEASE**

Refer to a nephrologist if new diagnosis or deterioration of renal function

Consider ESA + iron therapy to improve Hb (seek advice from nephrologist or haematologist)

If on regular haemodialysis seek advice from patient's nephrologist

**CHRONIC KIDNEY DISEASE**

Monitor Hb, platelet count, TIBC or TSAT  
se folate and renal function

Iron and folate deficiency can also occur in chronic kidney disease

Se ferritin > 30 mcg/l  
TIBC decreased

Normal se folate and vitamin B12 levels  
Normal renal function

Go to STEP 3

**NORMOCYTIC ANAEMIA OF UNKNOWN CAUSE**

Assess for acute or chronic inflammatory disease, chronic infection, malignancy and liver disease – check differential WCC, LFTs

If cause still unknown refer to a haematologist

**ANAEMIA OF CHRONIC DISEASE**

A diagnosis of exclusion, unresponsive to parenteral iron

Iron deficiency may also be present

Monitor and treat the underlying cause

4 STEPS IN THE INVESTIGATION AND MANAGEMENT



## MACROCYTIC ANAEMIA

**\*\*Normal range values may differ between hospital laboratories**

### STEP 1

- Full Blood Picture Test

If haemolysis detected in full blood picture test (and confirmed on repeat testing) - refer to a haematologist

MCV > 100 fl or  
MCH > 32pg  
Macrocytic anaemia

### STEP 2

- Test se folate, vitamin B12
- Urea, creatinine, eGFR
- Liver function tests

Low se folate and / or low vitamin B12 level

**FOLATE AND / OR VITAMIN B12 DEFICIENCY**

Normal renal function, se folate & B12 levels

Go to STEP 3

### STEP 3:

- Correct anaemia
- Investigate cause if unknown

#### FOLATE DEFICIENCY

- Start oral folic acid 5 mg daily  
If co-existing vitamin B12 deficiency start vitamin B12 injections at same time to avoid neurological complications
- Consider cause such as - poor diet, liver disease, alcohol misuse, gastro-intestinal surgery, recent pregnancy, chronic inflammatory disease (e.g. Crohn's disease or TB), malignancy and drug therapy (e.g. anticonvulsants)

#### VITAMIN B12 DEFICIENCY

- Hydroxocobalamin IM injections: 1 mg alternate days for 2 weeks, then 1 mg every 3 months for life
- Assess for malabsorption and consider post gastrectomy, terminal ileum disease or resection as causes

#### MACROCYTIC ANAEMIA OF UNKNOWN CAUSE

Assess for liver disease, alcohol misuse, hypothyroidism and drug causes (e.g. cytotoxic therapy) of anaemia

If myelodysplasia or myeloma suspected or if cause of anaemia still unknown refer to a haematologist

### STEP 4

- Monitor response to replacement therapy
- Treat disease causing the anaemia

### GUIDANCE ON THE INVESTIGATION

#### FOLATE INDUCED ANAEMIA

- Monitor Hb and reticulocyte count after 4 months replacement therapy
- Treat cause if identified

#### VITAMIN B12 DEFICIENCY INDUCED ANAEMIA

- Monitor Hb and reticulocyte count
  - after 10 days for response
  - after 8 weeks to check if Hb has returned to normal range

#### MACROCYTIC ANAEMIA not due to folate or vitamin B12 deficiency

- Monitor Hb
- Treat and monitor cause if identified



*From the Chief Medical Officer*  
Dr Michael McBride

HSS(MD) 22/2012

Circulation list:

**For Action:**

Chief Executives of HSC Trusts  
Medical Directors of HSC Trusts  
*(for onward distribution to All Hospital Doctors)*  
Director of Integrated Care, Health and Social Care Board  
All General Practitioners  
GP Locums  
Family Practitioner Service Leads, HSC Board  
*(for cascade to GP Out of Hours services)*  
Directors of Nursing of HSC Trusts  
*(for cascade to nursing staff)*



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**Health, Social Services  
and Public Safety**

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Our Ref: HSS(MD) 22/2012  
Date: 11 June 2012

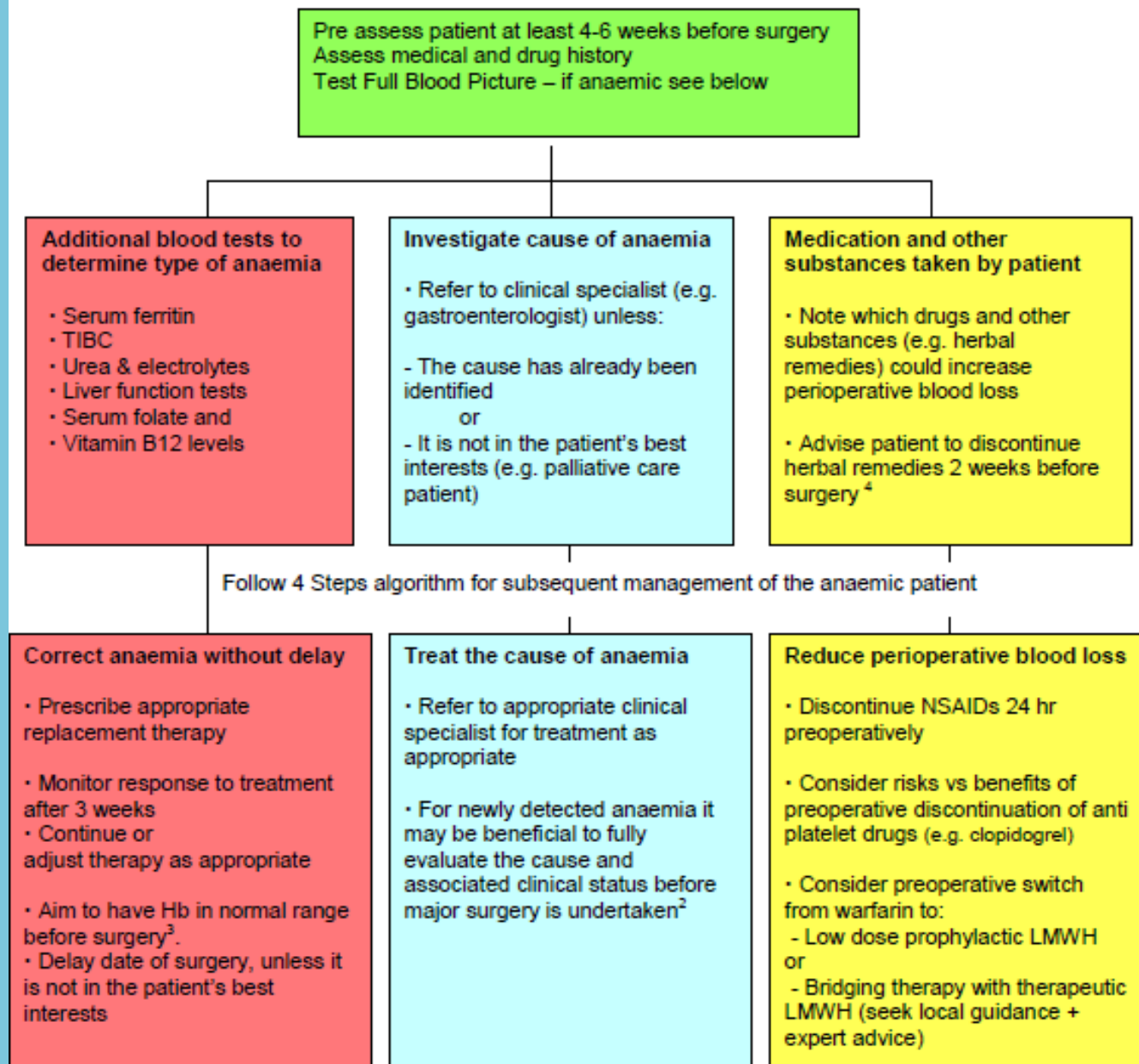
## **DETECTION, INVESTIGATION AND MANAGEMENT OF ANAEMIA**

1. The purpose of this letter is to disseminate two new guidance documents on the detection, investigation and management of anaemia. The documents are:
  - i. **FOUR STEPS IN THE INVESTIGATION AND MANAGEMENT OF THE ADULT PATIENT WITH ANAEMIA**
  - ii. **MANAGEMENT OF THE ANAEMIC ADULT PATIENT PRIOR TO SCHEDULED MAJOR SURGERY**

## MANAGEMENT OF THE ANAEMIC ADULT PATIENT PRIOR TO SCHEDULED MAJOR SURGERY

(Also applicable to other invasive procedures with potential for blood loss)

WHO definition of anaemia<sup>2</sup>: adult male < 130g/l adult female < 120g/l



**Conclusions:** We conclude that preoperative Hb predicts markers of orthoplasty outcome in UK practice. A systematic approach to optimize Hb mass before orthoplasty and limit Hb loss perioperatively was associated with improved outcome up to 90 days after discharge.



## 1st Pillar

### Optimise erythropoiesis

Preoperative

- Detect anaemia
- Identify underlying disorder(s) causing anaemia
- Manage disorder(s)
- Refer for further evaluation if necessary
- Treat suboptimal iron stores/iron deficiency/anemia of chronic disease/iron-restricted erythropoiesis
- Treat other haematinic deficiencies
- Note: Anaemia is a contraindication for elective surgery

Intraoperative

- Timing surgery with haematological optimisation

Postoperative

- Stimulate erythropoiesis
- Be aware of drug interactions that can increase anaemia

## 2nd Pillar

### Minimise blood loss & bleeding

- Identify and manage bleeding risk
- Minimising iatrogenic blood loss
- Procedure planning and rehearsal
- Preoperative autologous blood donation (in selected cases or when patient choice)
- Other

- Meticulous haemostasis and surgical techniques
- Blood-sparing surgical techniques
- Anaesthetic blood conserving strategies
- Autologous blood options
- Pharmacological/haemostatic agents

- Vigilant monitoring and management of post-operative bleeding
- Avoid secondary haemorrhage
- Rapid warming / maintain normothermia (unless hypothermia specifically indicated)
- Autologous blood salvage
- Minimising iatrogenic blood loss
- Haemostasis/anticoagulation management
- Prophylaxis of upper GI haemorrhage
- Avoid/treat infections promptly
- Be aware of adverse effects of medication

## 3rd Pillar

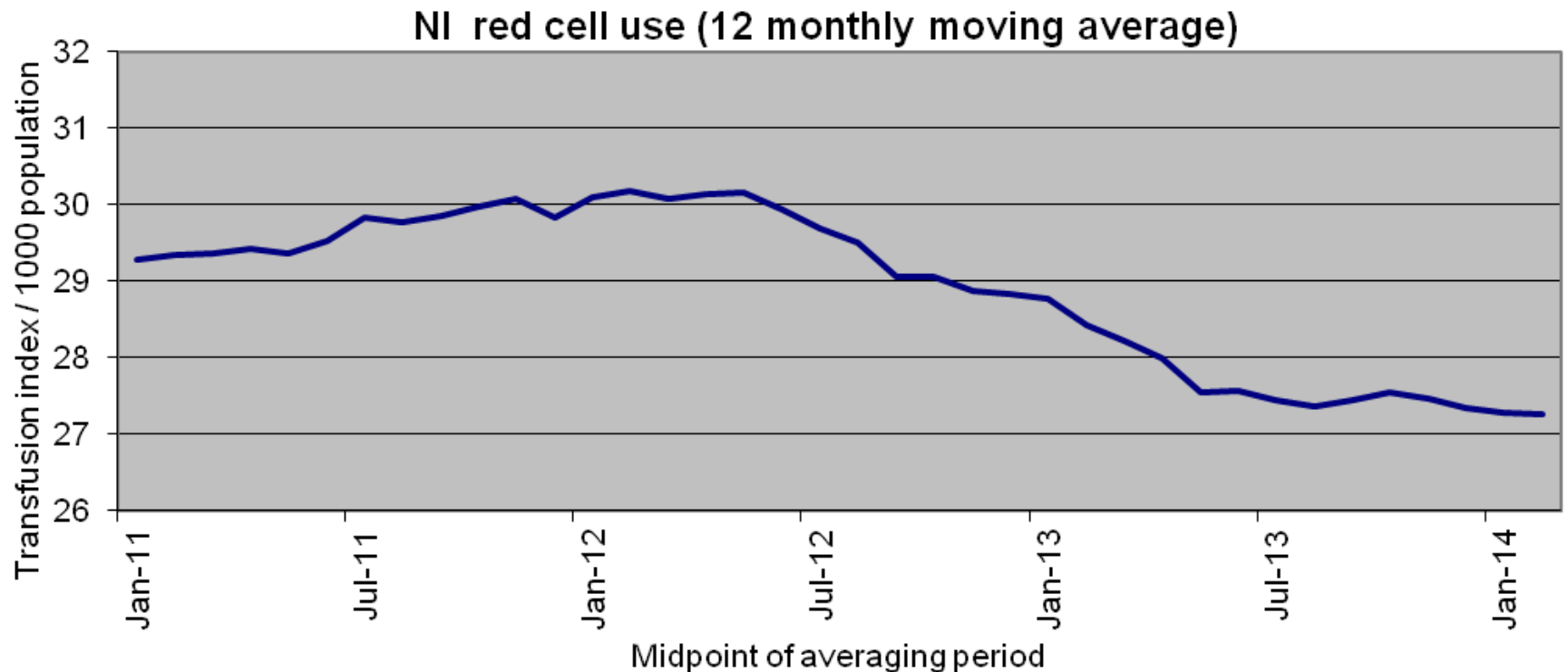
### Harness & optimise physiological reserve of anaemia

- Assess/optimize patient's physiological reserve and risk factors
- Compare estimated blood loss with patient-specific tolerable blood loss
- Formulate patient-specific management plan using appropriate blood conservation modalities to minimise blood loss, optimise red cell mass and manage anaemia
- Restrictive transfusion thresholds

- Optimise cardiac output
- Optimise ventilation and oxygenation
- Restrictive transfusion thresholds

- Optimise anaemia reserve
- Maximise oxygen delivery
- Minimise oxygen consumption
- Avoid/treat infections promptly
- Restrictive transfusion thresholds

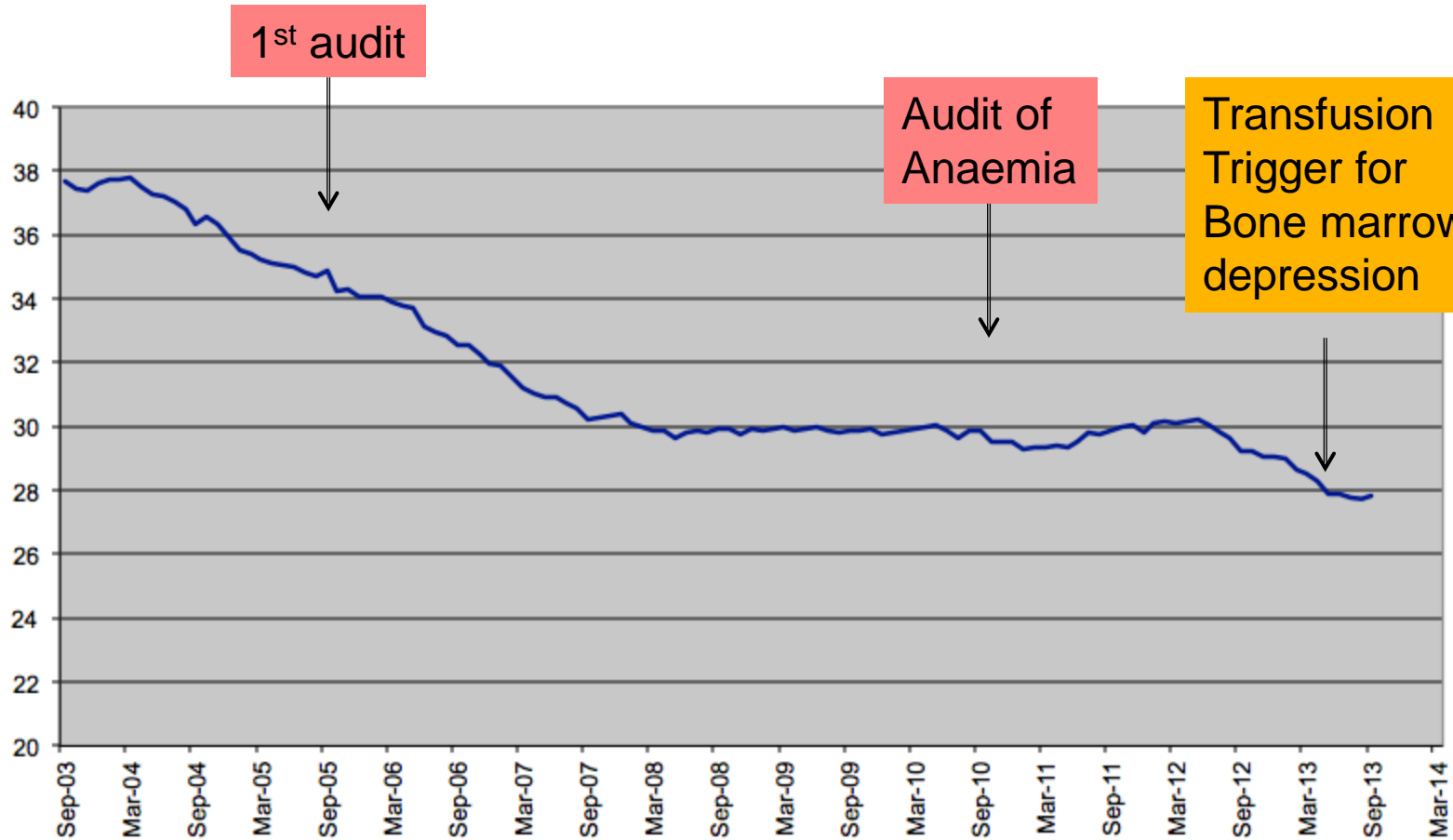
# Red Cell Transfusion Index 2011 - 2014



# NI Transfusion Index

( 12 monthly moving average)

Units transfused / 1000 of population



Month

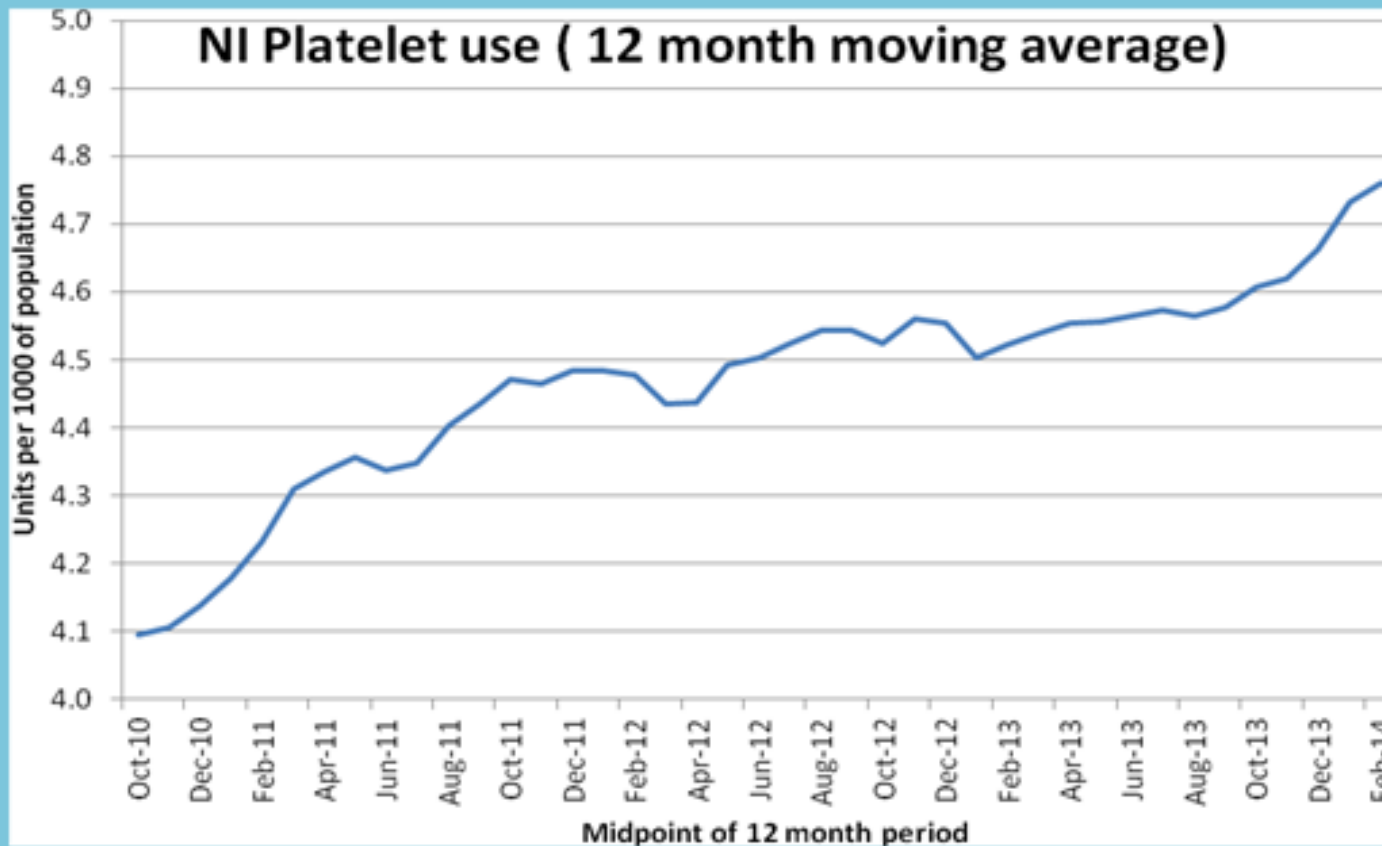
# Transfusion triggers for adults

Revised 2014

Patient status	Transfusion threshold
Healthy patient < 65 yr	Hb < 70 g/l
Healthy patient > 65 yr	Hb < 80 g/l
Cardiovascular disease	Hb < 90 g/l
Bone marrow suppression	Hb < 90 g/l
Chemo or Radiotherapy	Hb < 90 g/l
Sig. symptoms / signs of anaemia	Hb < 100 g/l
Active major bleeding	Hb < 100 g/l

Avoid over transfusion: Hb > 20g/l above target threshold

# Platelet issues





# Summary

- Steady decline in red cell transfusion index last 10 years
- Contributing factors include:
  - Audit process
  - Regional transfusion triggers
  - Regional guidance on management of anaemia
  - Stakeholder involvement
- Endorsement by Department of Health

# Acknowledgements

- NITC Members
- Haemovigilance Team, Shirley Murray
- Hospital Transfusion Committees
- Hospital Blood Banks
- CMO, DoH Advisory Committee
- Prof. Mike Murphy