NHS Blood and Transplant

2011 Medical Use of Blood Audit Part 1

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Apr 2012

The National Comparative Audit Programme

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- A series of audits designed to look at the use and administration of blood and blood components
- Open to all NHS Trusts and Independent hospitals in the UK
- Collaborative programme between NHS Blood and Transplant & Royal College of Physicians
- Funded in England by NHS Blood and Transplant

Why audit the use of red cells in medical patients?

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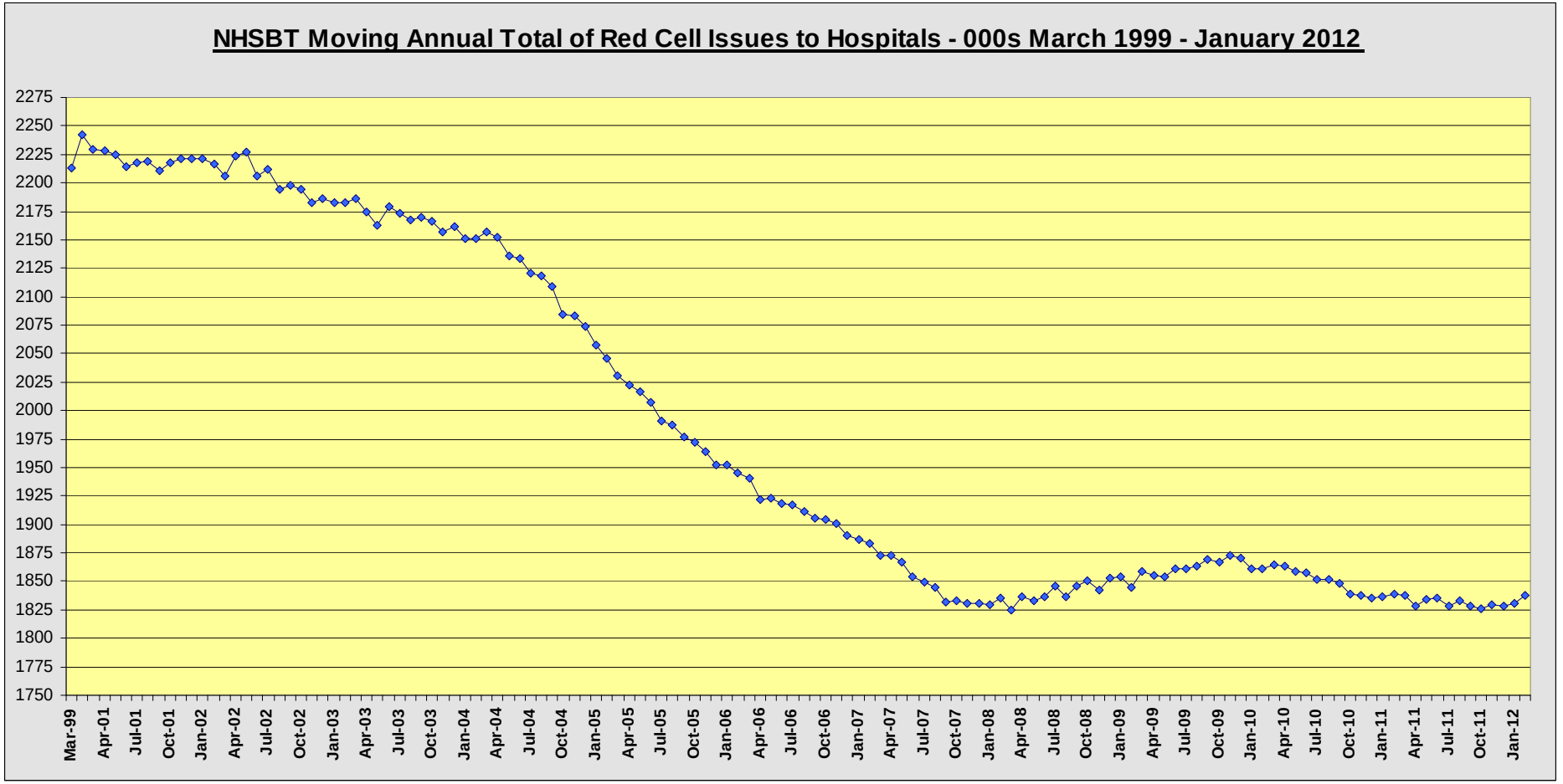

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Falling Use of Blood in Surgical Patients

Year of audit	Percentage of red cells transfused to medical patients	Percentage of red cells transfused to surgical patients
2000	52%	41%
2004	62%	33%
2008	64%	29%

Series of surveys undertaken in North East England and personal communication JP Wallis

Method

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- All medical red cell transfusions in one week of choice during September to November 2011, and 1 in 3 haematology/oncology cases (age > 18 years, excluding patients transfused in A&E and ICU)
- Case notes and laboratory information was used to gather data
- Results returned using web-based audit tool
- 181 sites (90% of NHS sites) returned data on 9216 cases

Appropriate red cell use in medical patients with anaemia

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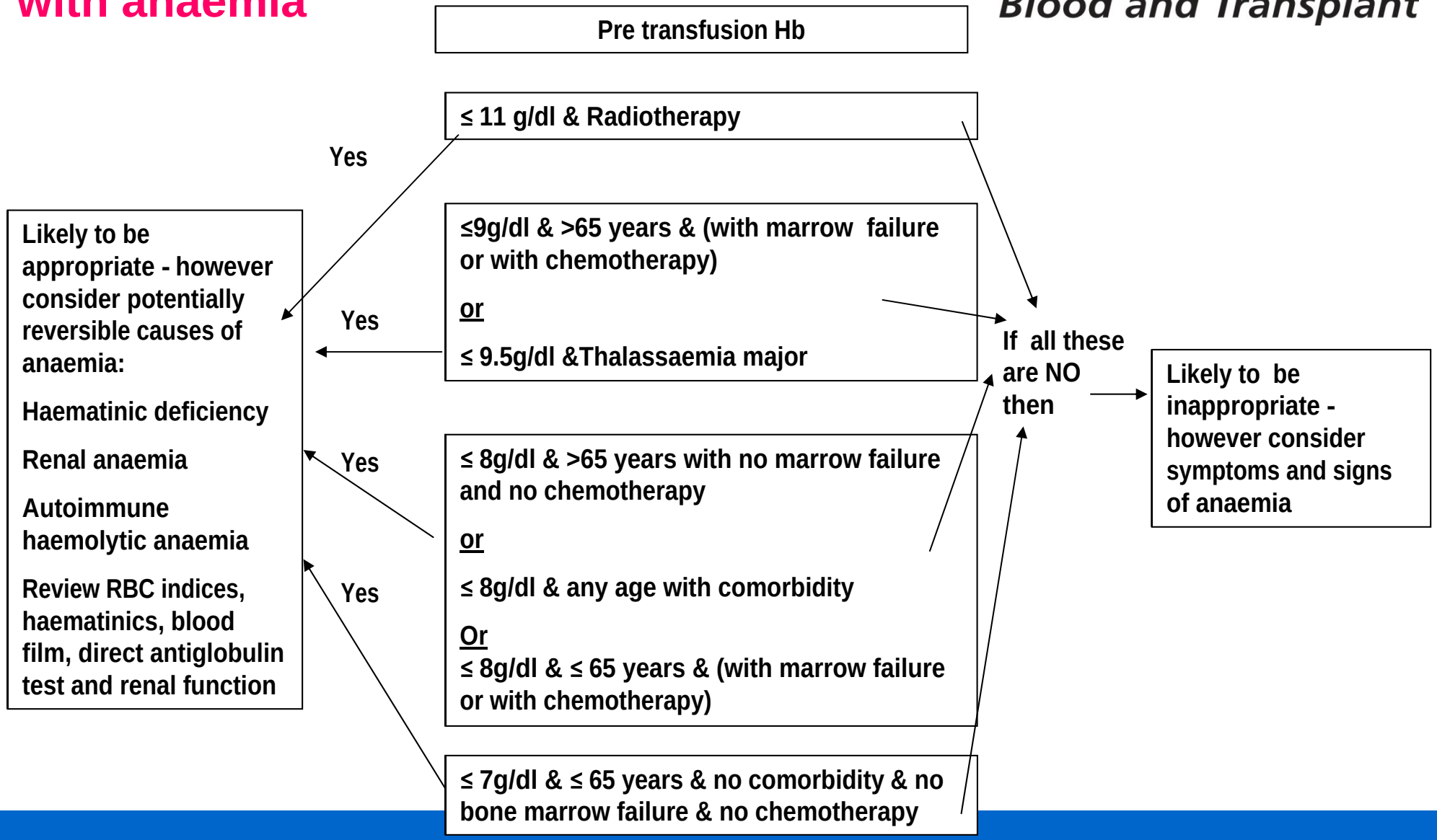

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1. Definition of reversible anaemia

Iron deficiency = Ferritin ≤15 mcg/l (female) or ≤ 20 mcg/l (male) **or** Iron studies suggestive of TSAT ≤20 or TIBC ≥ 85 micromol/l **or** MCV ≤ 78fl (in those without haematinic results)

B12 deficiency = B12 ≤ 150 ng/l (pg/ml)

Folate deficiency = Serum folate ≤ 2mcg/l (ng/ml) **or** Red cell folate ≤ 80 mcg/l (ng/ml)

Autoimmune haemolytic anaemia = Either diagnosis of 'haemolysis – acquired autoimmune' or Direct Antigloblin Test 'Positive' or grade 1 and above

Renal Anaemia = patients with calculated eGFR of ≤ 30 (Chronic Kidney Disease stage 4 to 5) without bleeding and without acute renal failure

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2. Unnecessary transfusion

Transfusion of patients with potentially reversible anaemia

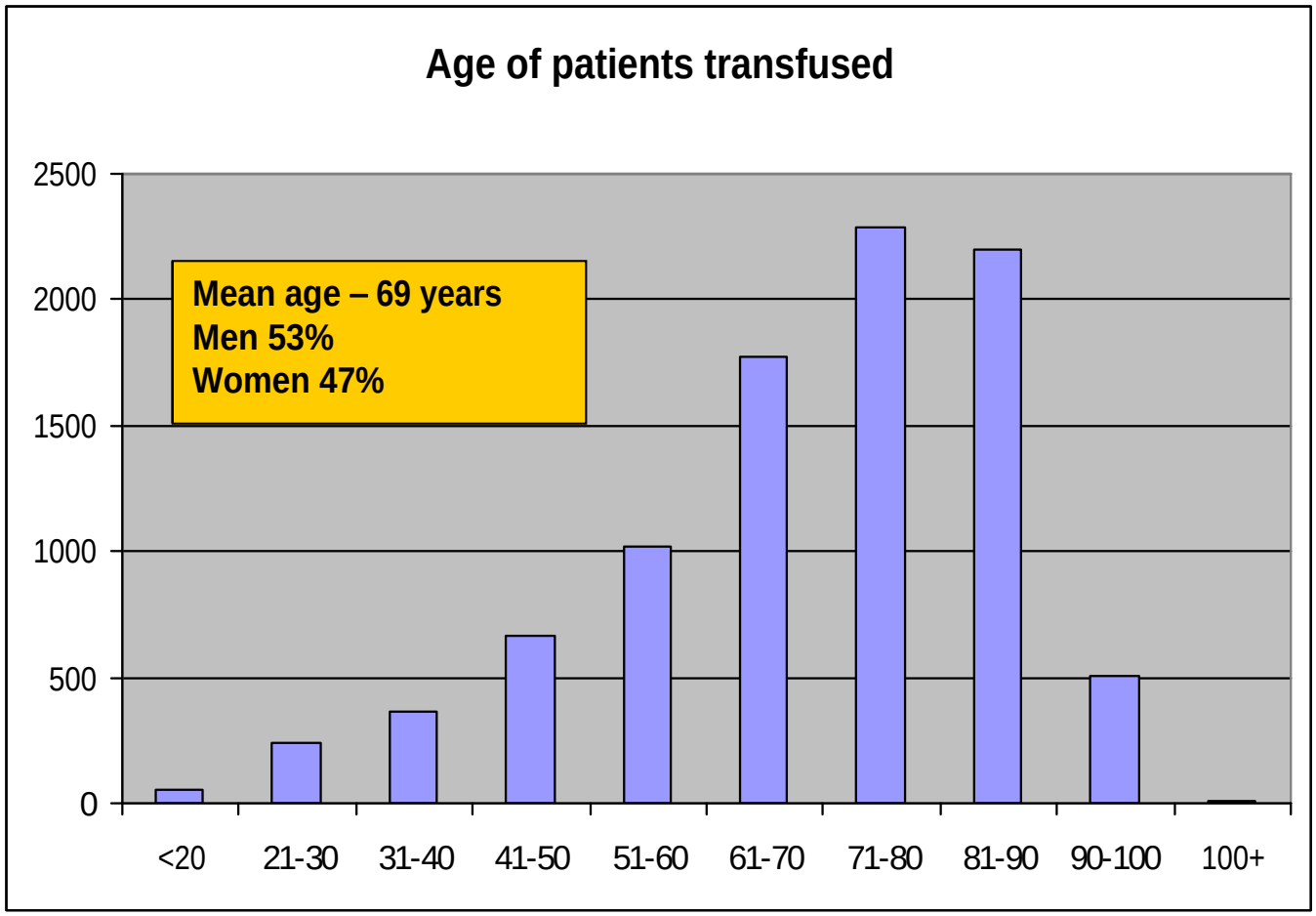
Transfusion above pre-Tx Hb trigger

Patients with bleeding and Hb >10 g/dl
Patients with radiotherapy and Hb >11 g/dl
Patients with thalassaemia and Hb >9.5 g/dl
Patients with bone marrow failure or with chemotherapy and >65 years old and Hb >9 g/dl
Patients with bone marrow failure or with chemotherapy and ≤65 years old and Hb >8 g/dl
Patients >65 years old and Hb >8 g/dl
Patients with comorbidity (at any age) and Hb >8 g/dl
Patients ≤ 65 years with no comorbidity, no bone marrow failure and no chemotherapy, and Hb > 7g/dl
Defining bone marrow failure: Haematological diagnosis such as leukaemia, myeloma, lymphoma , myelodysplasia, aplastic anaemia

3. Over transfusion

Transfusion to more than 2g/dl above threshold pre-Tx Hb

Demographics



Reason for Transfusion

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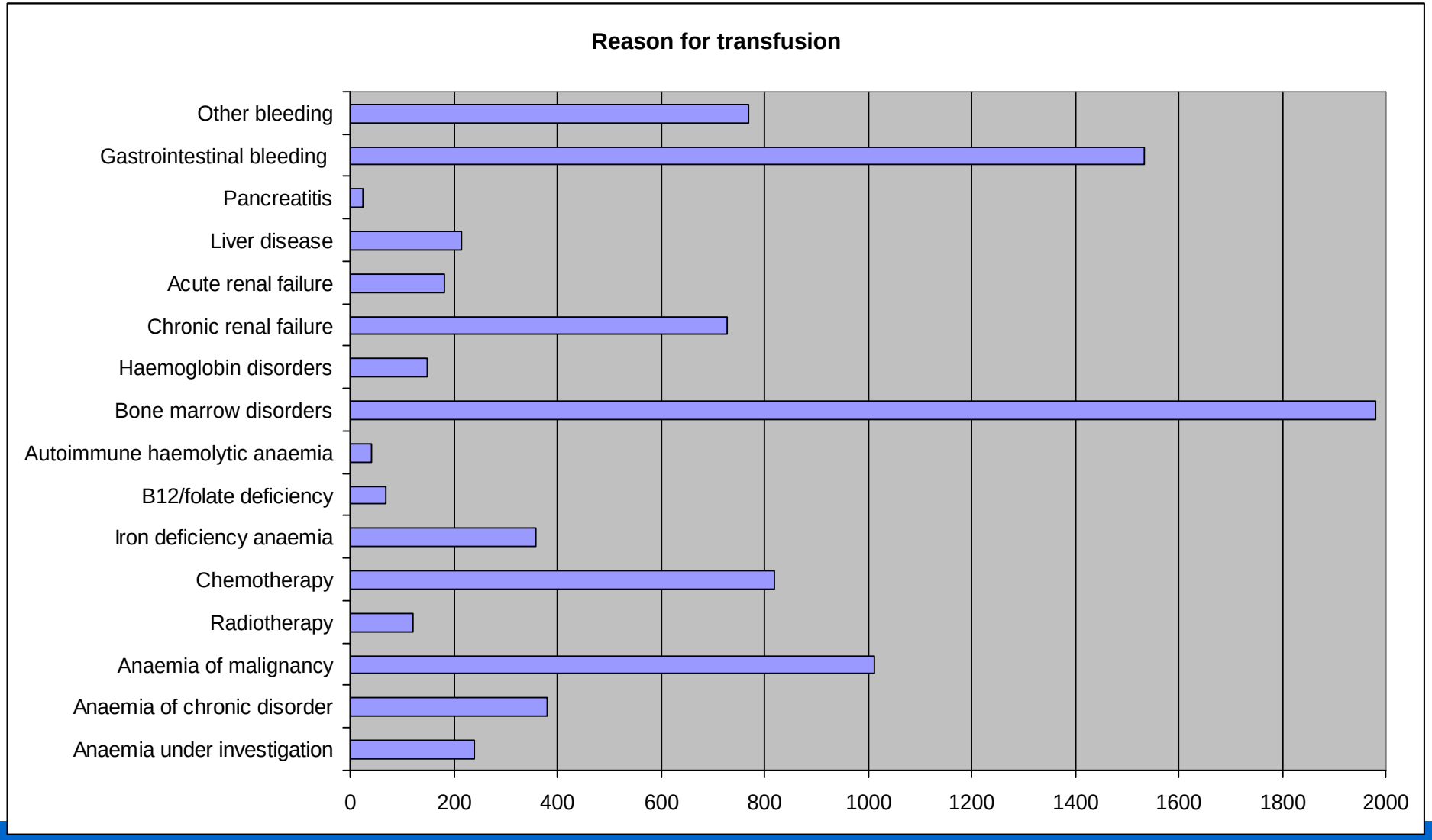
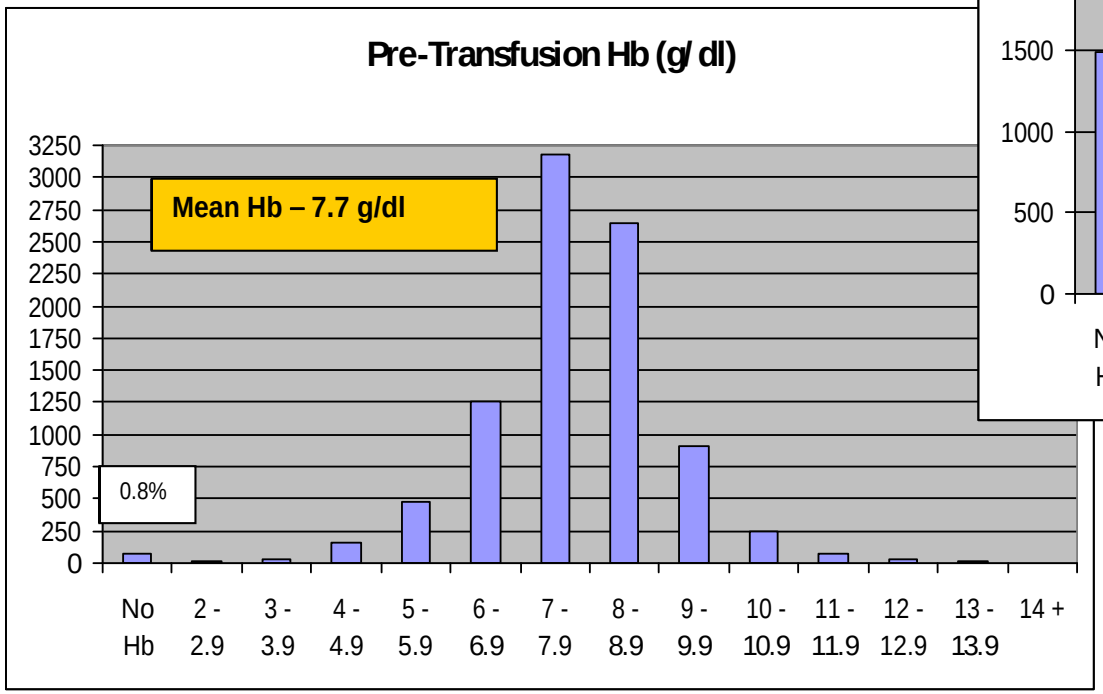
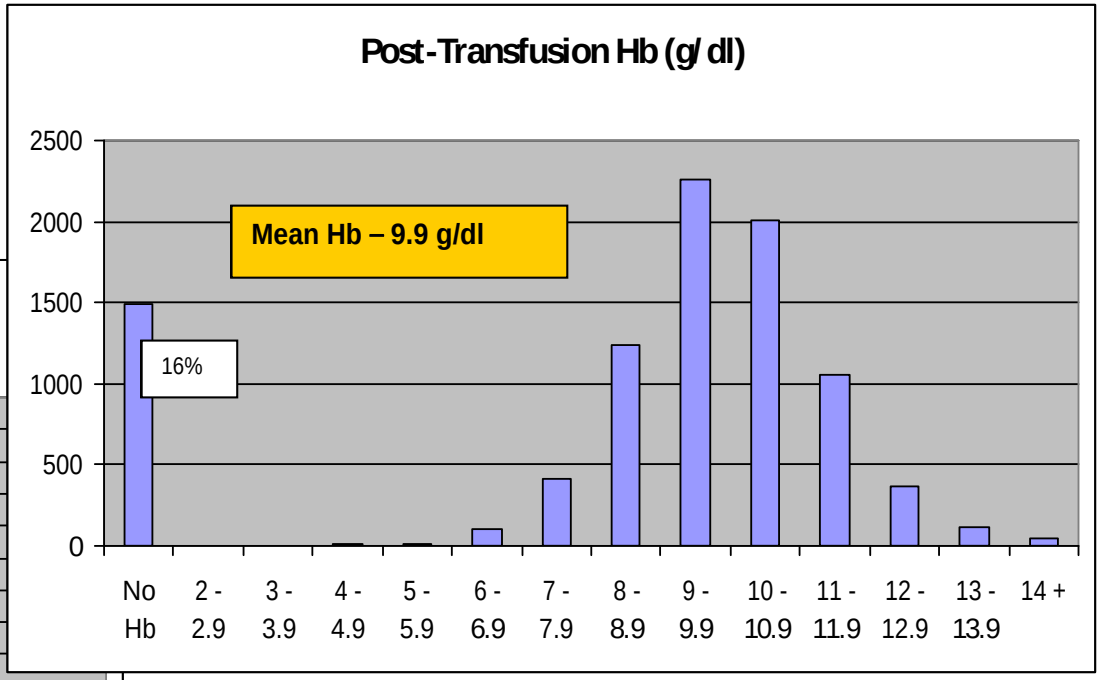


Pre and post transfusion Hb values





Defining possible cases of iron deficiency

Parameter	Men	Women
Total number	4791	4335
With ferritin result (%)	1774 (37%)	1725 (40%)
With ferritin ≤ 20 mcg/l (male) or ≤ 15 mcg/l (female)	248	341
With transferrin saturation ≤ 20 in cases without ferritin results	58	78
With MCV ≤ 78 fl in cases without ferritin or iron studies	210	264
Total possible iron deficiency	**516**	**683**

Defining possible cases of B12 / folate deficiency

Parameter	
Total number	9126
With B12 result	3127 (34%)
With B12 ≤ 150 ng/l (pg/ml)	111
With serum folate	2757 (30%)
With serum folate ≤ 2mcg/l (ng/ml)	95
With red cell folate (and no serum folate)	220
Red cell folate ≤ 80 mcg/l (ng/ml)	31
Total B12/folate deficiency	**237**

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Possible autoimmune haemolytic anaemia (AIHA)

Parameter	
Total number	9126
With DAT result	437 (5%)
With DAT Positive or grade 1 and above	137
Total possible AIHA	**137**

Possible renal anaemia

Parameter	
Total number	9126
Number of patients after patients with ‘acute renal failure’ and ‘bleeding’ removed	7454
With creatinine result available	7100
With eGFR ≤ 30	**1084**

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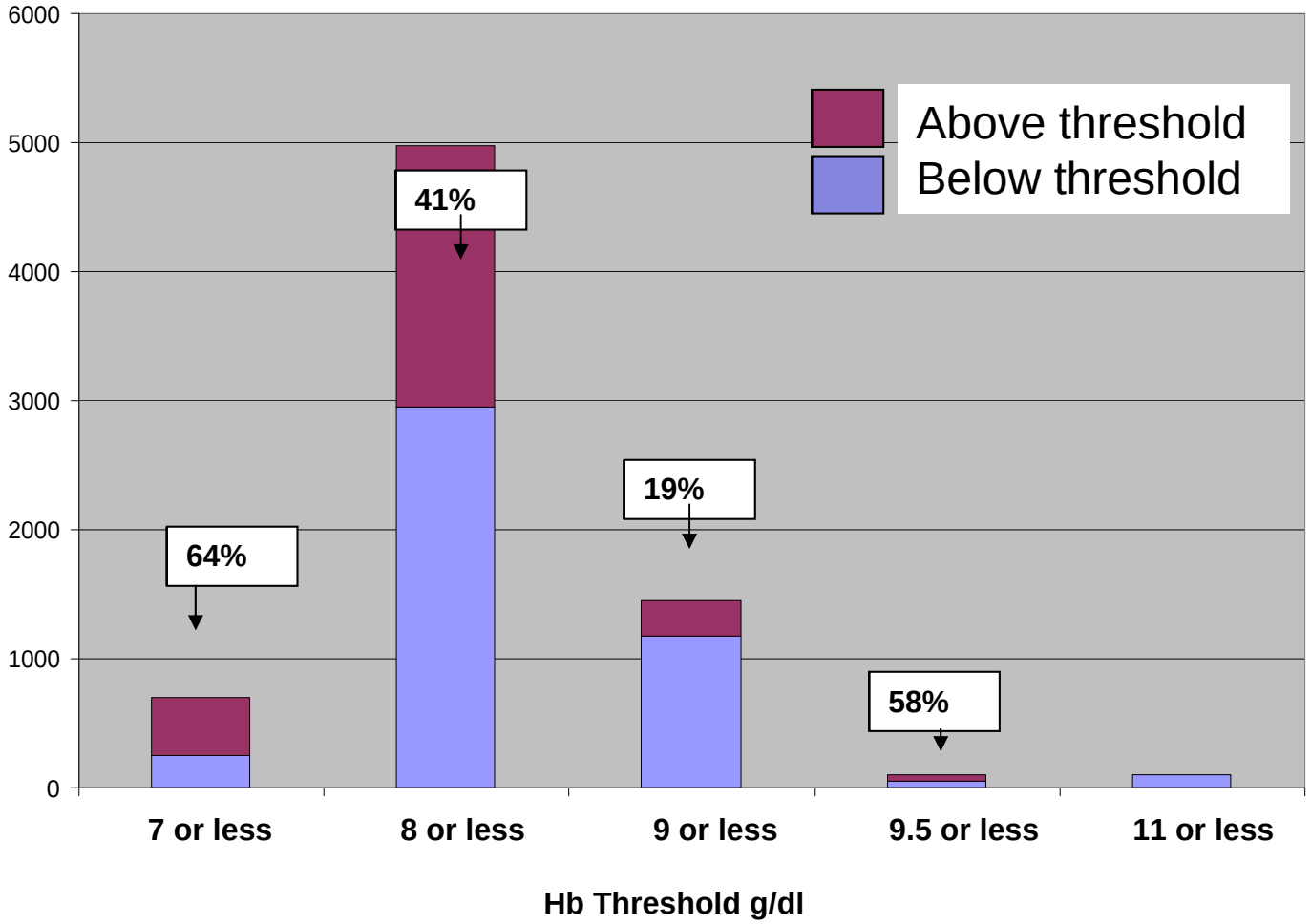
Total number of cases of possible reversible anaemia

Total number	9126
Number of possible reversible anaemia cases	2657 (29%)

Patients with anaemia transfused above and below Hb threshold



Patient category	Total Number	Number with Hb above threshold	% above threshold
Radiotherapy	103	7 (pre-transfusion Hb > 11g/dl)	7%
Thalassaemia	106	62 (pre-transfusion Hb > 9.5g/dl)	58%
Age greater than 65 years	4662		
Age greater than 65 years with bone marrow failure	1202	212 (pre-transfusion Hb > 9/g/dl)	18%
Age greater than 65 years with chemotherapy	246	59 (pre-transfusion Hb > 9 g/dl)	24%
Age greater than 65 years without bone marrow failure or chemotherapy or comorbidity	705	221 (pre-transfusion Hb > 8 g/dl)	31%
Any age with cardiovascular / respiratory comorbidity (defined according to drug therapy)	3706	1482 (pre-transfusion Hb > 8 g/dl)	40%
Age 65 years or less	2464		
Age 65 years or less with bone marrow failure	354	175 (pre-transfusion Hb > 8 g/dl)	49%
Age 65 years or less with chemotherapy	215	156 (pre-transfusion Hb > 8 g/dl)	73%
Age 65 years or less & no bone marrow failure & no chemotherapy & no comorbidity	698	446 (pre-transfusion Hb >7g/dl)	64%
Total	7335	2820	38%
Patients with bleeding	1773	107 (pre-transfusion Hb >10 g/dl)	6%

Conclusions

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- High rate of transfusion in cases with potentially reversible anaemia and transfusion above thresholds recommended by National Indication Codes
- Overall 48% of patients were transfused outwith standards set by the audit group
- Reasons are multifactorial and require further investigation in phase 2 of the audit which commenced in April 2012

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Discussion

- Why are patients with potentially reversible anaemia being transfused?
  - Significant symptoms / signs of anaemia
  - Inadequate recognition, investigation and treatment of anaemia
  - Pressure for early discharge

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Discussion

- Why are patients being transfused above the thresholds set in the audit?
  - Symptoms and signs of anaemia at higher Hb levels
  - Physicians may not have caught up with surgeons and intensivists with regards to awareness of the lack of benefit of liberal transfusion practice vs. restrictive transfusion practice

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Discussion

- The pre transfusion Hb value alone is an imperfect indicator of appropriate transfusion
- Clinical judgement is required
- It would be great to have a bedside test that could aid the decision making process

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Next steps

- Results of the audit will be used to raise awareness of the recommendations for transfusion management of patients under the care of physicians
- Tools will be developed to support the recognition, investigation and management of anaemia plus simple guidelines to support transfusion decision-making

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Acknowledgments

- The clinicians in UK hospitals who are participating in the audit
- The Royal College of Physicians