

# Scottish Consensus Guideline on the Management of Pre-operative Anaemia

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# Declarations



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- Royal College of Anaesthetists Lead for Perioperative Medicine, Glasgow Royal infirmary
- Advisory panel for Vifor Pharma



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# Pre-operative anaemia



- Why is it important?
- What stops us doing something about it?
- How do we manage it?



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# Why is it important?



- Prevalence: affects between 20-60% of all patients undergoing major elective surgery.
- Significance: independent risk factor for complications in the perioperative period.



Meta-analysis of the association between preoperative anaemia and mortality after surgery.  
BJS 2015; 102: 1314-1324.

Published: 9th September 2015

Authors: A. J. Fowler, T. Ahmad, M. K. Phull, S. Allard, M. A. Gillies, R. M. Pearce et al.




- 949,445 patients
- 39.1% anaemic
- ↑ short term mortality after surgery
- ↑ risk of AKI and infection after surgery
- ↑ risk of stroke following cardiac surgery


# Allogenic Blood Transfusion



- Pre-operative anaemia is one of the strongest predictors for perioperative ABT.
- Patients receiving blood transfusion have poorer post-operative outcomes and have poorer long term survival in cancer surgery.








Blood and Transplant


# 2015 Survey of Patient Blood Management

## What is Patient Blood Management?

Patient Blood Management (PBM) is an evidence-based, multidisciplinary approach to optimising the care of patients who might need transfusion.




PBM puts the patient at the heart of decisions made about blood transfusion to ensure they receive the best treatment and avoidable, inappropriate use of blood and blood components is reduced.




National, regional and local audits in England consistently show inappropriate use of all blood components;

15-20%  
red cells

20-30%  
platelets/plasma.







PBM represents an international initiative in best practice for transfusion medicine.



Evidence shows that the implementation of PBM improves patient outcomes by focussing on measures for the avoidance of transfusion and reducing the inappropriate use of blood and therefore can help reduce health-care costs.

PBM improves patient care by reducing inappropriate transfusion and also helps to ensure the availability of blood components for those patients where there are no transfusion alternatives.



doi:10.1111/anae.13773

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M. Liumbruno,<sup>7</sup>  
sman,<sup>13</sup>

lence

# Why aren't we managing it?

- **Barriers:**
- Lack of knowledge
- Lack of time in the surgical pathway
- Lack of funding
- Lack of evidence – does avoiding blood transfusion make a difference to outcome?

Misconception	Key points
The prevalence of anaemia in surgical patients is similar to the general population	The likelihood of preoperative anaemia in the surgical population in developed countries can exceed the prevalence among the general population.
The WHO definitions of anaemia are always valid for patients undergoing major surgery.	The concept of 'sub-optimal preoperative Hb concentration' ( $\text{Hb} < 13 \text{ g dl}^{-1}$ for both genders) would make more sense. We propose a desirable target for preoperative Hb optimization is a concentration $\geq 13 \text{ g dl}^{-1}$ .
Preoperative anaemia may be caused by many conditions and some may be ameliorated or cured by the proposed surgery	Should the cause of preoperative anaemia be unrelated to the condition for which surgery is required, most probably it will not resolve after surgery.
Preoperative anaemia poses no risk to patients, and scheduled procedures should not be delayed because of its presence.	Preoperative anaemia is independently associated with worse clinical outcome. Appropriate evaluation and treatment may require rescheduling the procedure, when possible.
Preoperative anaemia management negatively impacts hospital personnel work-load and is not cost-effective	In most patients, detection and classification of preoperative anaemia can be accomplished using routine laboratory parameters, without significantly increasing health care professional work-load or hospital budgets.
High-dose, oral iron supplementation is usually efficacious in correcting preoperative anaemia.	Both IDA and ACI with or without ID are frequent among surgical patients. Pathophysiology of ACI and issues related to tolerance can explain the lack of efficacy of oral iron salts.
i.v. iron is hazardous and should only be used for treating severe preoperative anaemia	i.v. iron allows for a rapid and more complete haematological response and replenishment of iron stores. Available data strongly suggest all i.v. iron formulations have a favourable benefit-risk profile, when used appropriately.
Newer i.v. iron formulations are very expensive and not cost-effective	Newer i.v. iron formulations are safe, cost-effective and more efficient than oral treatment. They also are more convenient both for the patient and for the health system.
Preoperative erythropoietin administration poses a high thrombotic risk and should not be used.	To safeguard the efficacy and safety of rHuEPO therapy, within the approved indications, we advise on an individually tailored dose, adequate iron ensured with adjuvant i.v. iron, and the deep venous thrombosis prophylaxis administered.

# Evidence



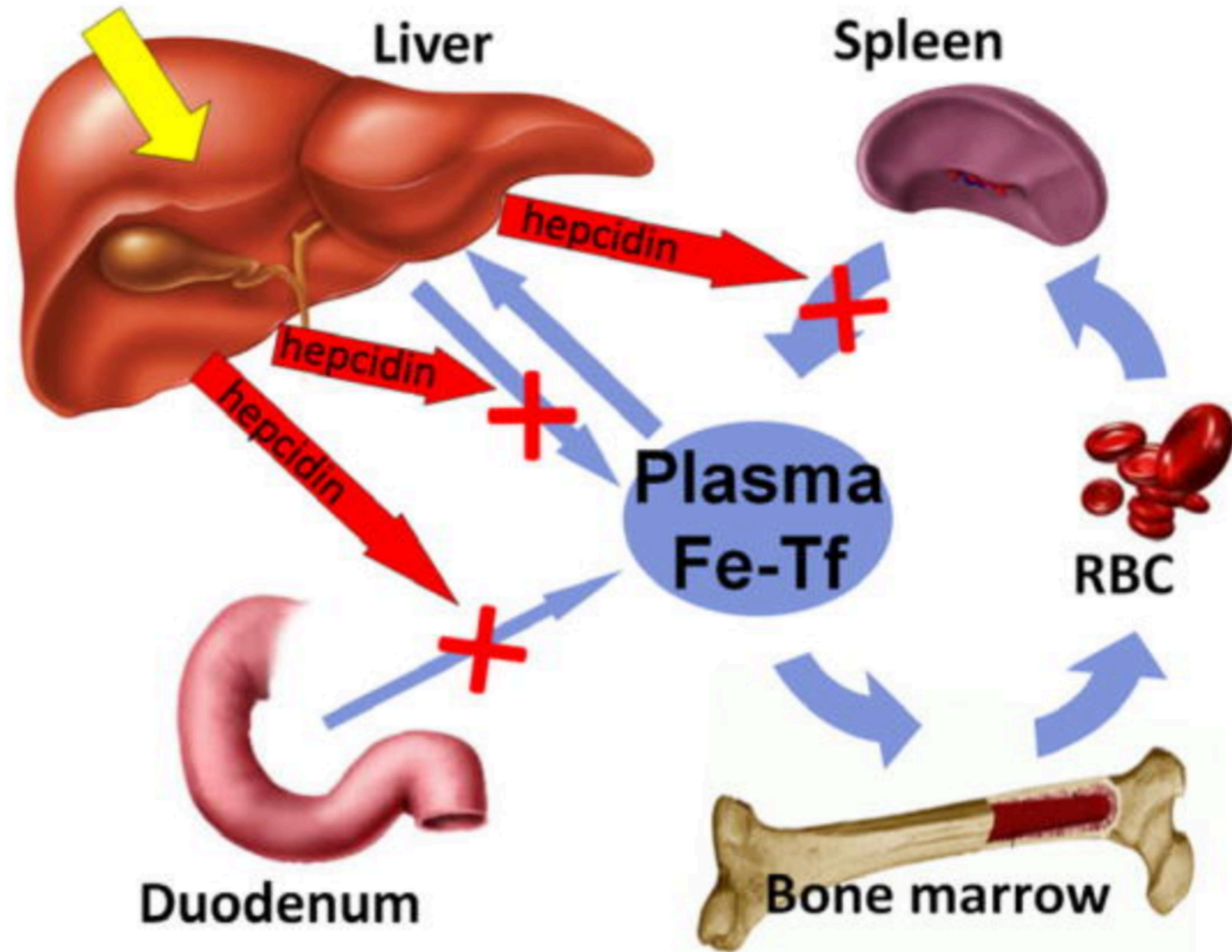
- PREVENTT
- CAVIAR
- ITACs
- IRONMAN
- ICaRAS
- IVICA
- NHSBT PBM National comparative audit June 2019
- NICE Pre-op Guideline 2020



# How do we manage it?

- Most common cause is iron deficiency
- Functional iron deficiency/anaemia of chronic disease
- Folate deficiency
- B12 deficiency
- Bleeding

Inflammation



# Functional iron deficiency

- Common in cancer/inflammation
- Total body iron normal
- Hepcidin inhibits iron absorption from the duodenum to the plasma
- Iron sequestered in reticuloendothelial system, duodenal cells and macrophages
- Ferritin levels ↑
- transferrin saturation ↓

# Iron replacement



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# Iron replacement

- Oral iron
- IV iron
- ESAs
- Blood transfusion



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# Background



- A working party of Scottish Perioperative Medicine Clinical Leads met to develop an evidence-based guideline for the management of pre-operative anaemia.
- **Aim** - To support Scottish hospitals in developing preoperative anaemia pathways to reduce the number of patients presenting for elective and urgent surgery with untreated anaemia.

# Consensus



- Definition “general or widespread agreement”
- based our recommendations on the most up to date evidence and current guidelines
- also took into account collective experience of implementing guidelines locally, common obstacles and pitfalls encountered, as well as experience of overcoming these barriers.

## Scottish Standard for the Optimisation of Preoperative Anaemia

Patients who are anaemic who present for elective or urgent surgery (with an anticipated blood loss of > 500 ml or >10% blood volume) in Scotland should have this investigated before surgery.

Preoperative anaemia is associated with increased postoperative morbidity and mortality. Treating iron deficiency with iron supplements can reduce the need for transfusion, length of hospital stays and cost<sup>1</sup>.

### Process

1. Any patient having surgery with blood loss expected to be greater than 500 ml should have an FBC and haematinics taken as early as possible before surgery. \*This may be in primary care (pre-referral), surgical outpatients, preassessment clinic or ward.

2. The diagnosis of anaemia should be made using the AAGBI C

3. Units should develop pathways for the management of anaemia. a. If the anaemia is an iron deficiency anaemia (IDA) or iron deficiency, consider IV iron as early as possible before surgery.

b. If the anaemia is macrocytic or anaemia of chronic inflammation, seek urgent expert advice.

4. Units should develop pathways for the management of anaemia before surgery.

a. If anaemia is diagnosed, surgery should be delayed with further investigation and treatment of the anaemia.

b. **During investigation, the possibility of a malignancy must be considered.** Pathways for the investigation of a possible malignancy should be developed.

c. If an IDA is diagnosed, first-line treatment should be with IV iron. \*This may be prescribed by the preassessment clinic, GP or purchased by the patient.

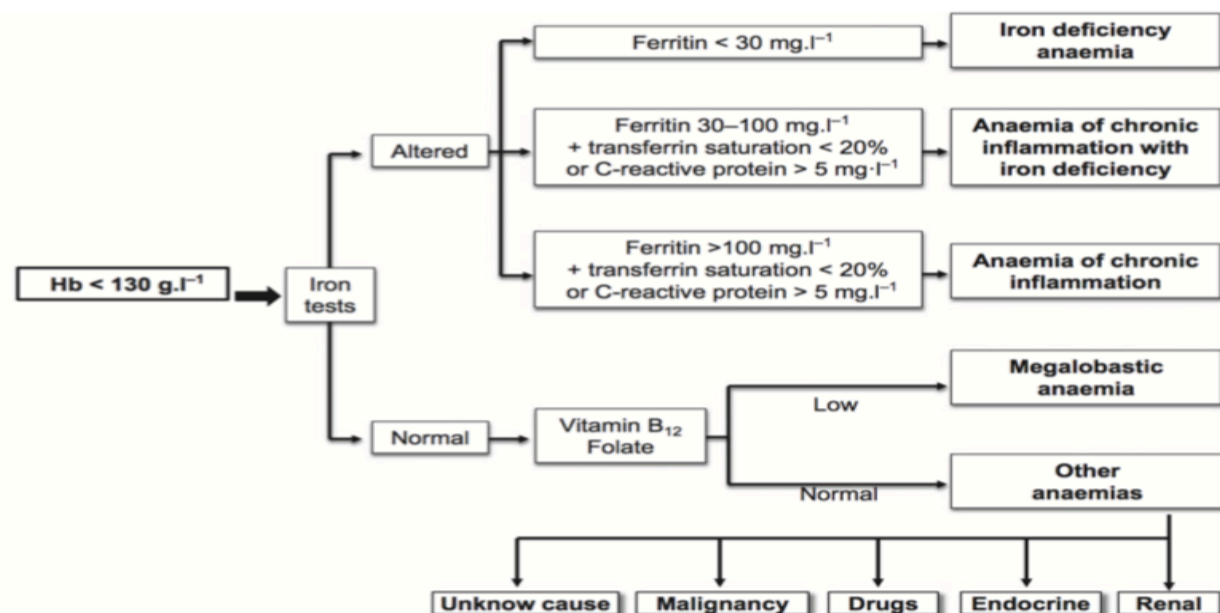
d. A patient with a macrocytic anaemia should be discussed with the haematologist.

e. Patients with anaemia of chronic inflammation with iron deficiency are a group who may have a lower target haemoglobin. Experience should be shared with the haematologist for the management of this group.

f. Patients with anaemia of chronic inflammation with iron deficiency (a functional iron deficiency) should be treated as iron deficient. However, the first line of treatment should be with IV iron.

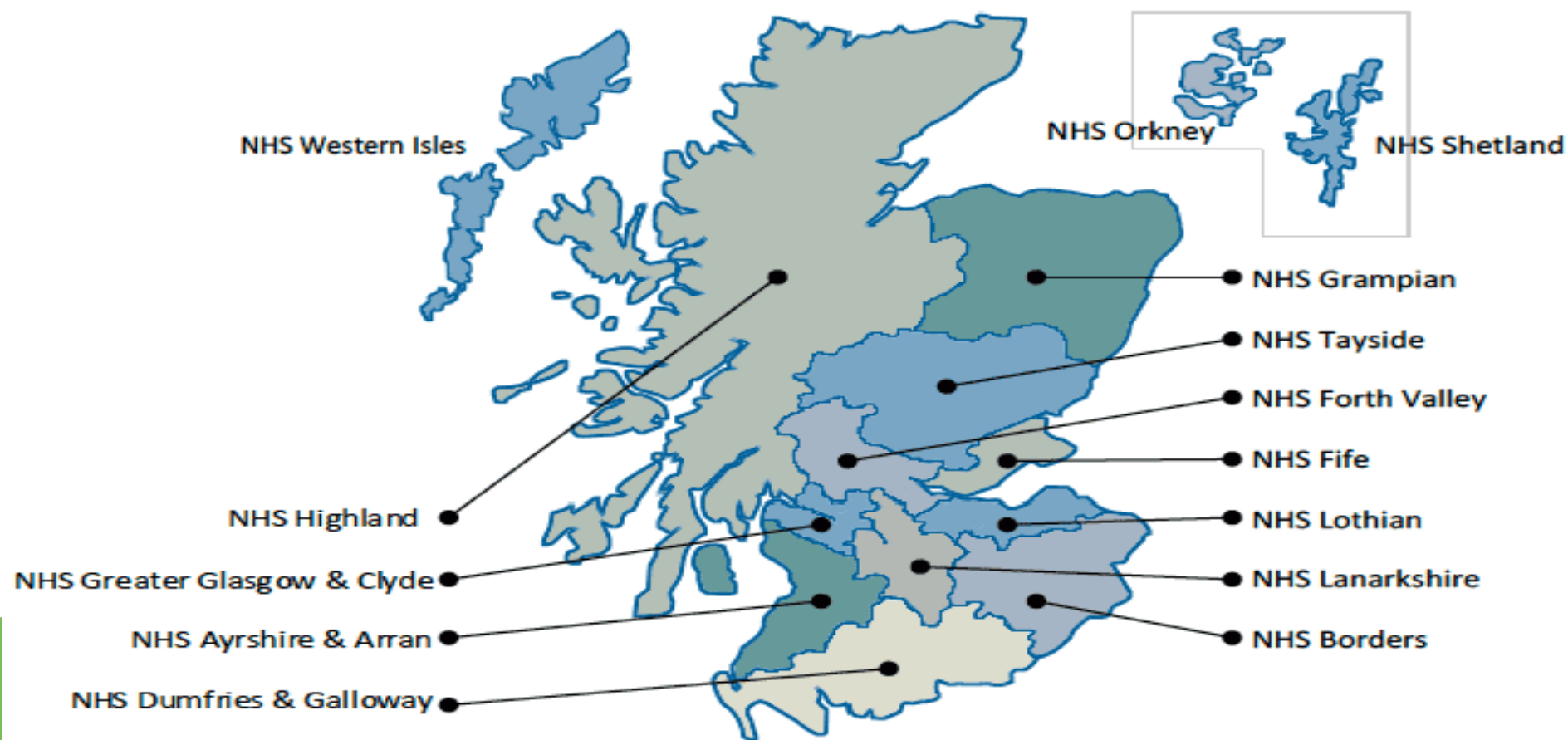
### Figure 1 – Diagnosis of anaemia<sup>2</sup>

The recent AAGBI consensus statement recommend a single haemoglobin value of 130g/L as the diagnosis and treatment target in both males and females. However, units may continue to use the WHO definition of anaemia (male < 130 g/L, female < 120 g/L). Either way, local agreement on a value is essential.



### Figure 2 – IV iron

IV iron should ideally be given 4-6 weeks before surgery. With urgent surgery, this is often not an available timescale. As IV iron replenishes stores in preparation for the accelerated erythropoiesis seen following blood loss, it should be considered up to and including on the day of surgery as this will still reduce the need for perioperative transfusion. Remember, IV iron can also be given postoperatively.



# Funding & Support



- Scottish Government “Whole System Patient Flow”
- Launch Event October 2018
- Multidisciplinary
- Scottish Blood Transfusion Service
- Laboratory services



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# Funding & Support



- Business Case
  - Hospital specific
  - One year – non recurring
  - Agreement to review and internally support post 1 year
- National Quarterly Meetings
- Data systems for national reporting/benchmarking
- Information shared via online hub



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# Management of Preoperative Anaemia in Scotland

A Scottish consensus guideline has been agreed for both the diagnosis and management of preoperative anaemia, by the RCoA Perioperative Medicine Scottish Leads anaemia group, and will be released to all Scottish hospitals on 26th October 2018.

This Knowledge Hub group will be an opportunity for stakeholders to participate via polls, blogs, forums and network with local, national and international experts on the management of pre-operative anaemia and implementation of guidelines. The KHub will also be the home for relevant documents, guidelines and publications.

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**Facilitators**

# National Reporting – What are the benefits?



- Drive Improvement
- Evolutionary
- Shared purpose
- Support sustainable implementation



# National Reporting – What are the benefits?



Data used for comparison and shared learning:

- **How do you compare to other sites?**

Hospital C has the lowest transfusion rate

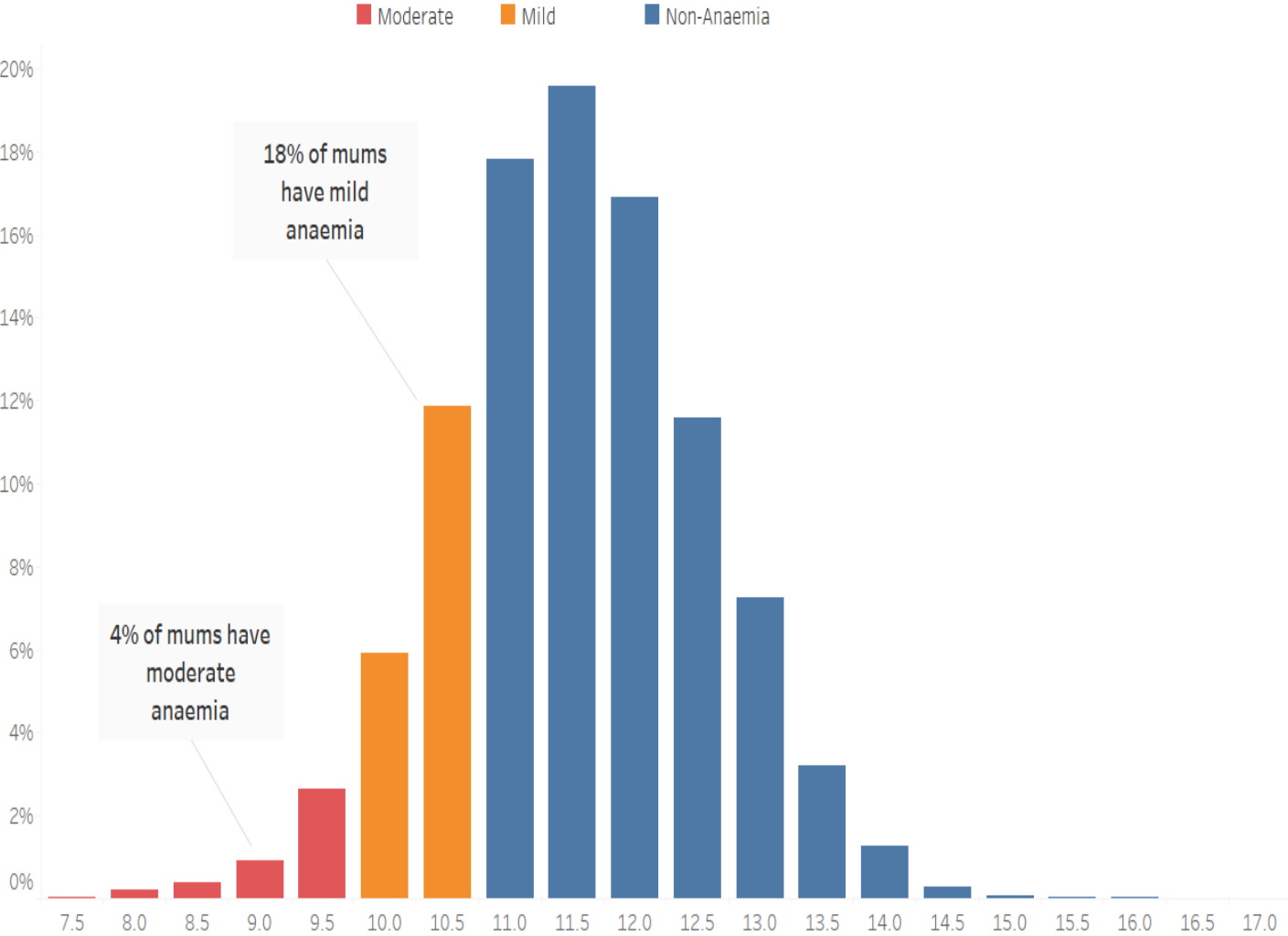
- **Are they doing something you are not?**

Hospital C shared their process at a national meeting

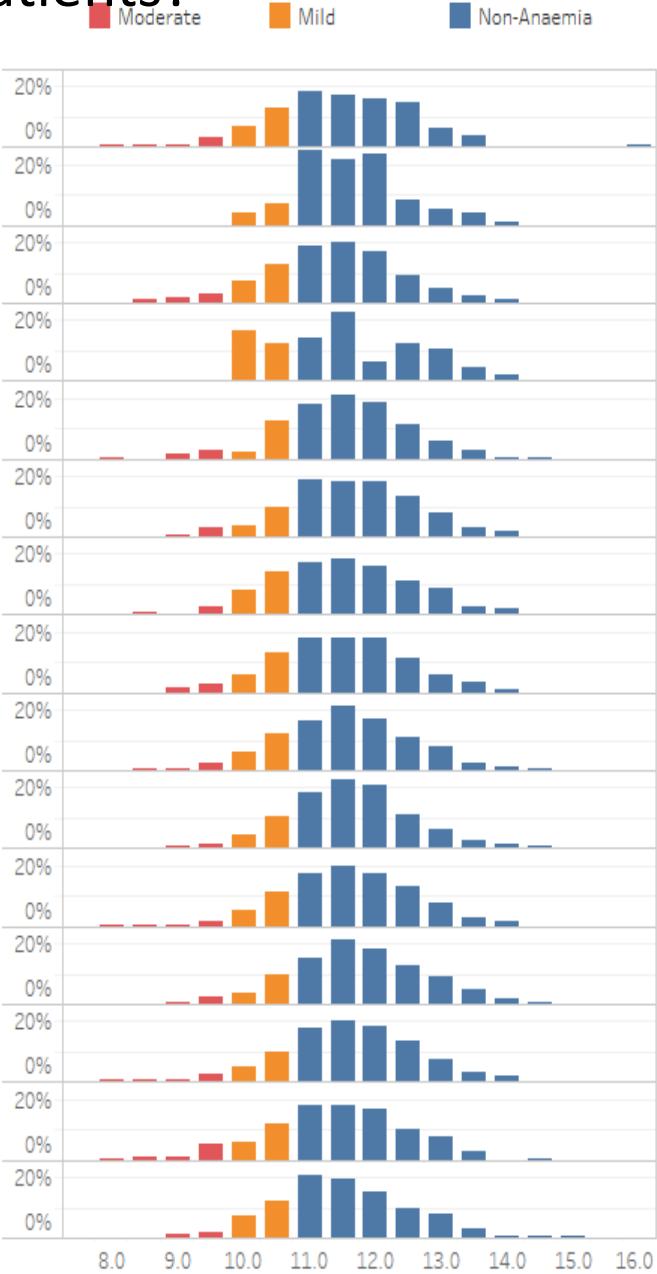
- **Can you learn from them?**

Various sites have visited them to find out what they are doing and how they are doing it

Preop Hb distribution - 22% of mums are anaemic



# All hospital are treating different patients?





Interdisciplinary  
Blood Conservation  
Modalities

Managing  
Anemia

**IMPROVED  
PATIENT  
OUTCOMES**

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Optimizing  
Coagulation

Patient-Centered  
Decision Making