Using data to support Patient Blood Management

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@PBM_NHS @KatePendry @CMFTtransfusion

The use of big data in transfusion medicine.
Transfusion Medicine 25 129 2015


IBM Watson


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NICE

NICE Quality Standards

Draft Statement 1:

People with iron deficiency are offered oral iron before and after surgery

Draft Statement 2:

Adults who are having surgery and expected to have moderate blood loss are offered tranexamic acid

Draft Statement 3*:*

People who receive a single unit red cell blood transfusion, or equivalent volume, are clinically assessed and have their Hb levels checked after the transfusion.

What it is trying to say is that non-bleeding patients should be reassessed for Hb after the first unit (and subsequent) units to decide whether or not to proceed with subsequent transfusions. The standard will be reworded and leave out reference to single unit policy

Draft statement 4:

People who may have or who have had a transfusion are given verbal and written information about the benefits and risks of transfusion

ChoosingWisely UK

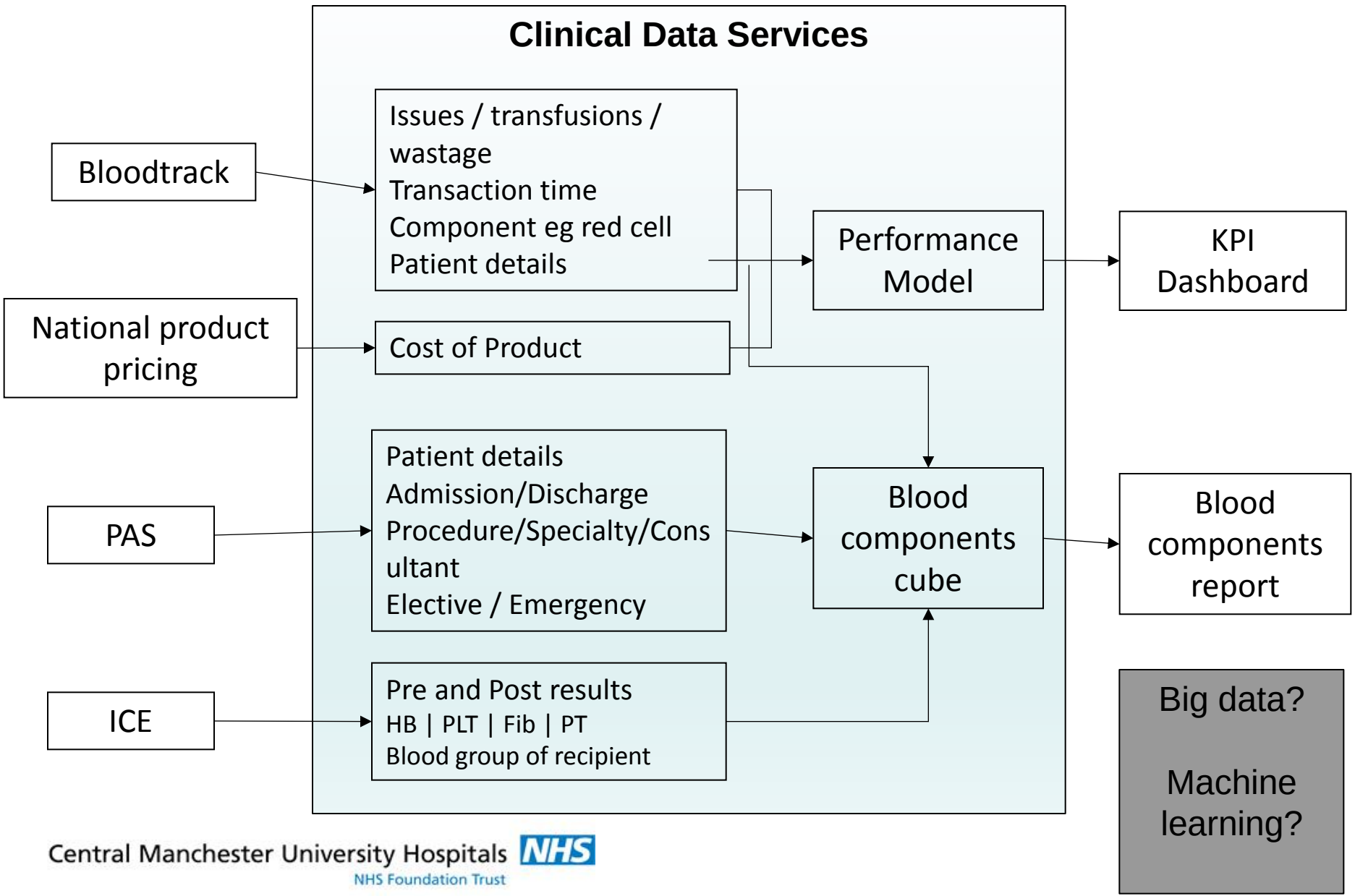
Choosing Wisely

1. 'Only consider transfusing platelets for patients with chemotherapy-induced thrombocytopenia where the platelet count is < 10 x 10*9/L except when the patient has clinical significant bleeding or will be undergoing a procedure with a high risk of bleeding.‘

2. 'Use restrictive thresholds for patients needing red cell transfusions and give only one unit at a time except when the patient has active bleeding.‘

3. 'Only transfuse O Rh D negative red cells to O RhD negative patients and in emergencies for females of childbearing potential with unknown blood group.'

Patient Blood Management Dataset



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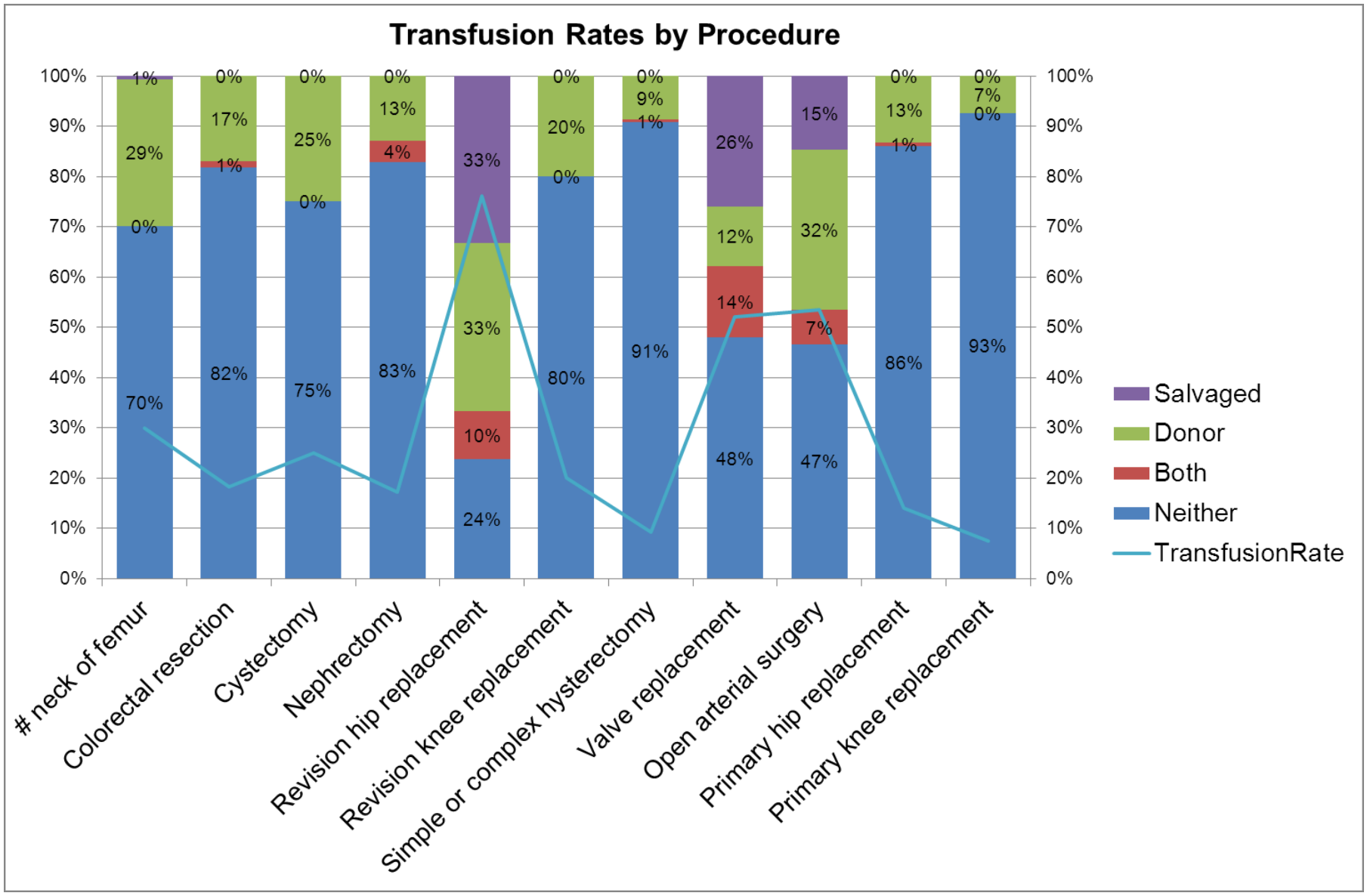
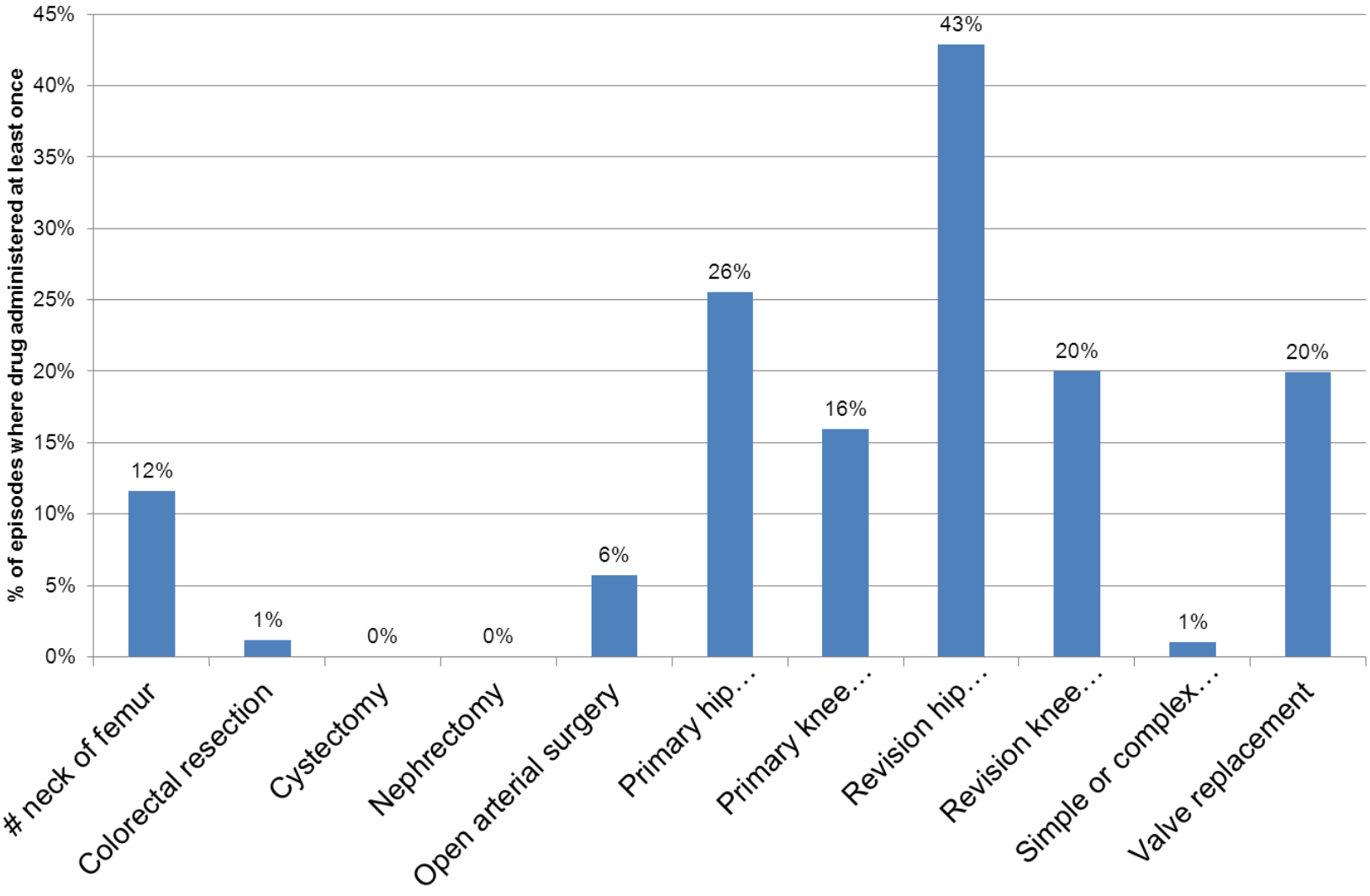
PBM KPI dashboard

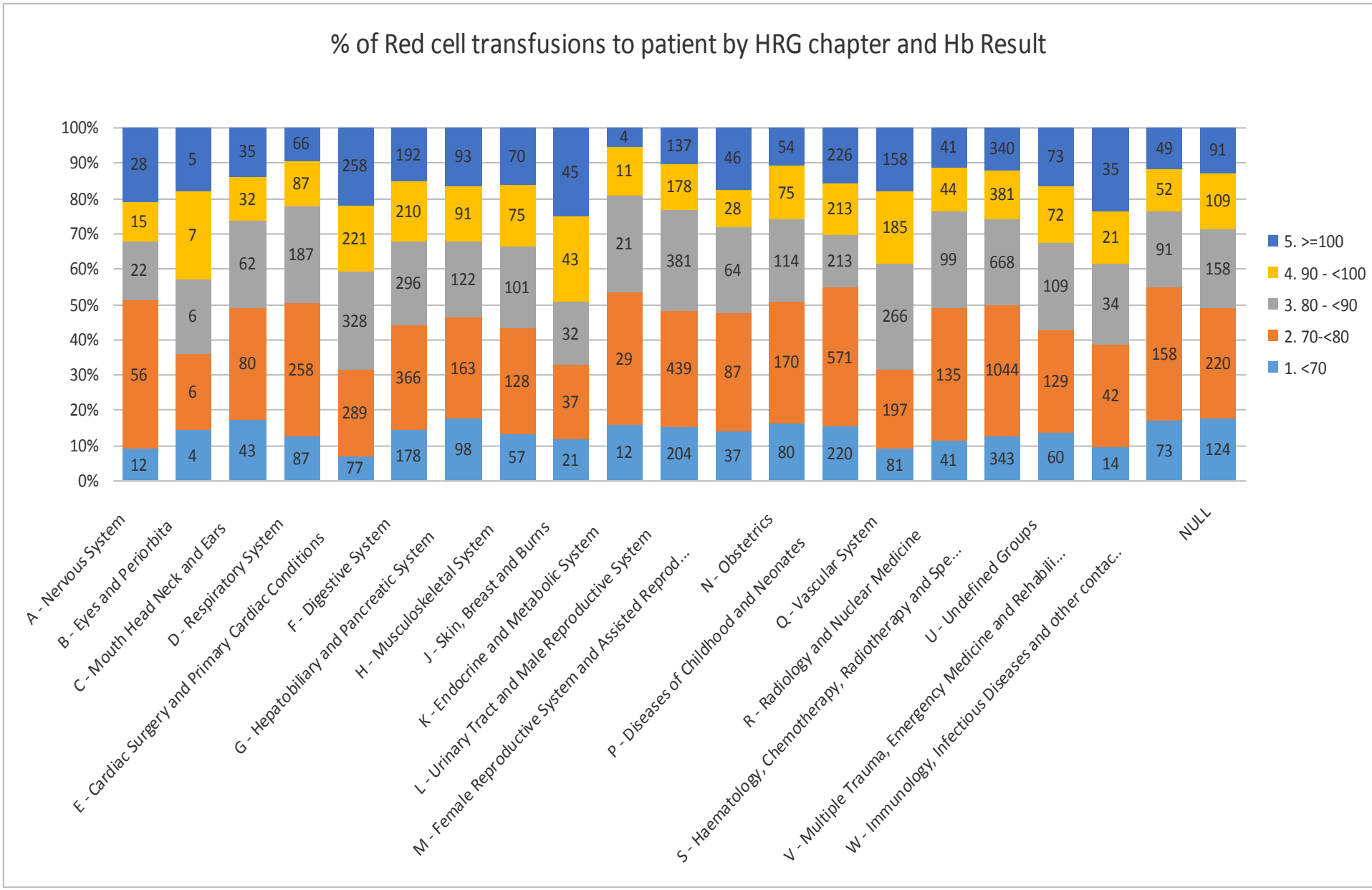
Indicator	13/14	14/15	15/16	YTD	Threshold	Status	Trend - Oct 2015 : Sep 2016
Patient Transfusions							
Transfusion rate per 1000 bed days	59.3	64.7	61.2	55.7	62.6		
Transfusion rate per 1000 bed days: Red cell	41.9	44.9	44.8	43.0	46.2		
Transfusion rate per 1000 bed days: Platelet	11.4	13.9	12.3	10.5	11.9		
Transfusion rate per 1000 bed days: Fresh frozen plasma	4.7	4.7	3.5	1.6	4.0		
Transfusion issue	52,126	54,715	54,694	23,691	26,287		

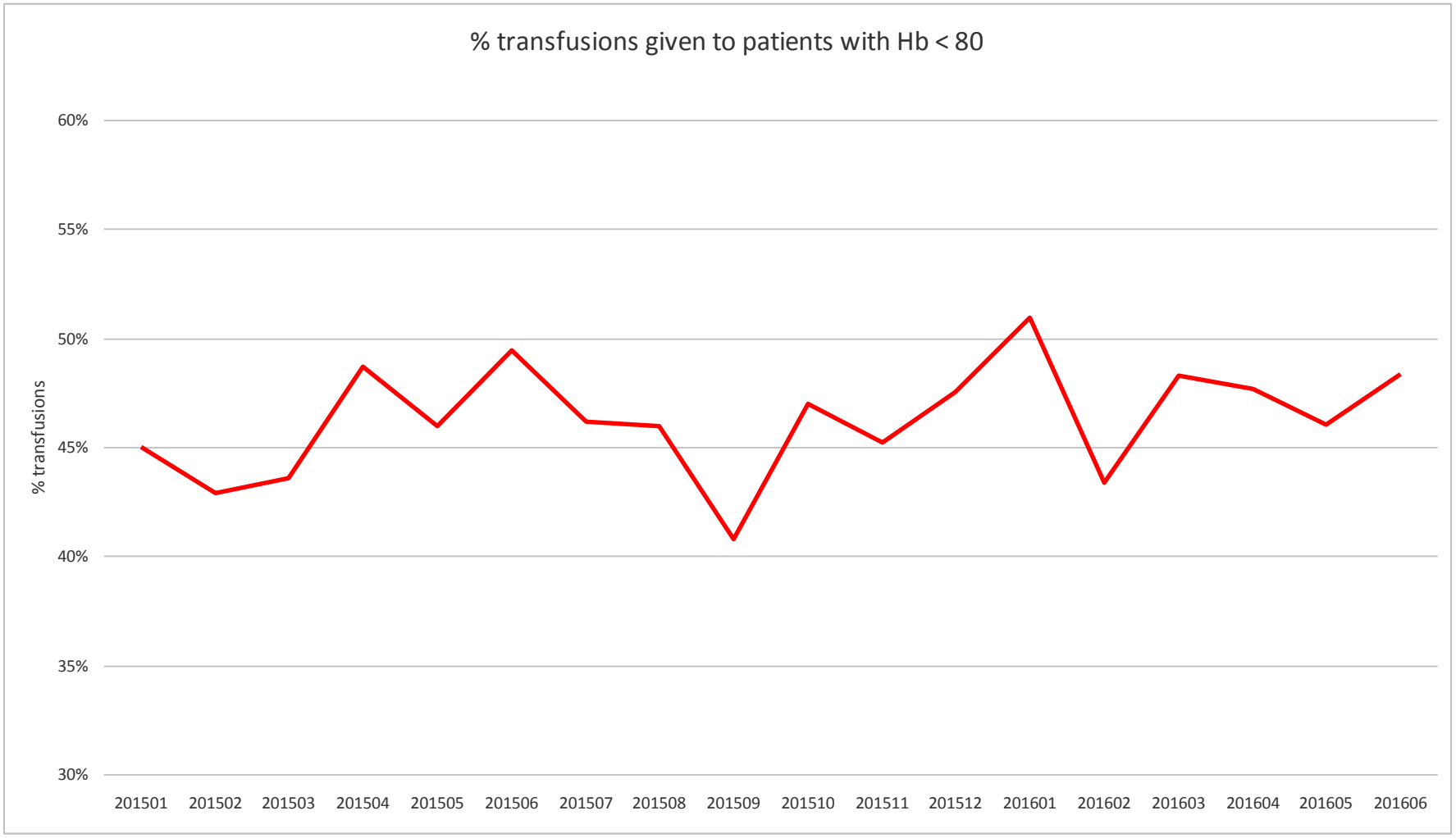
PBM in surgery

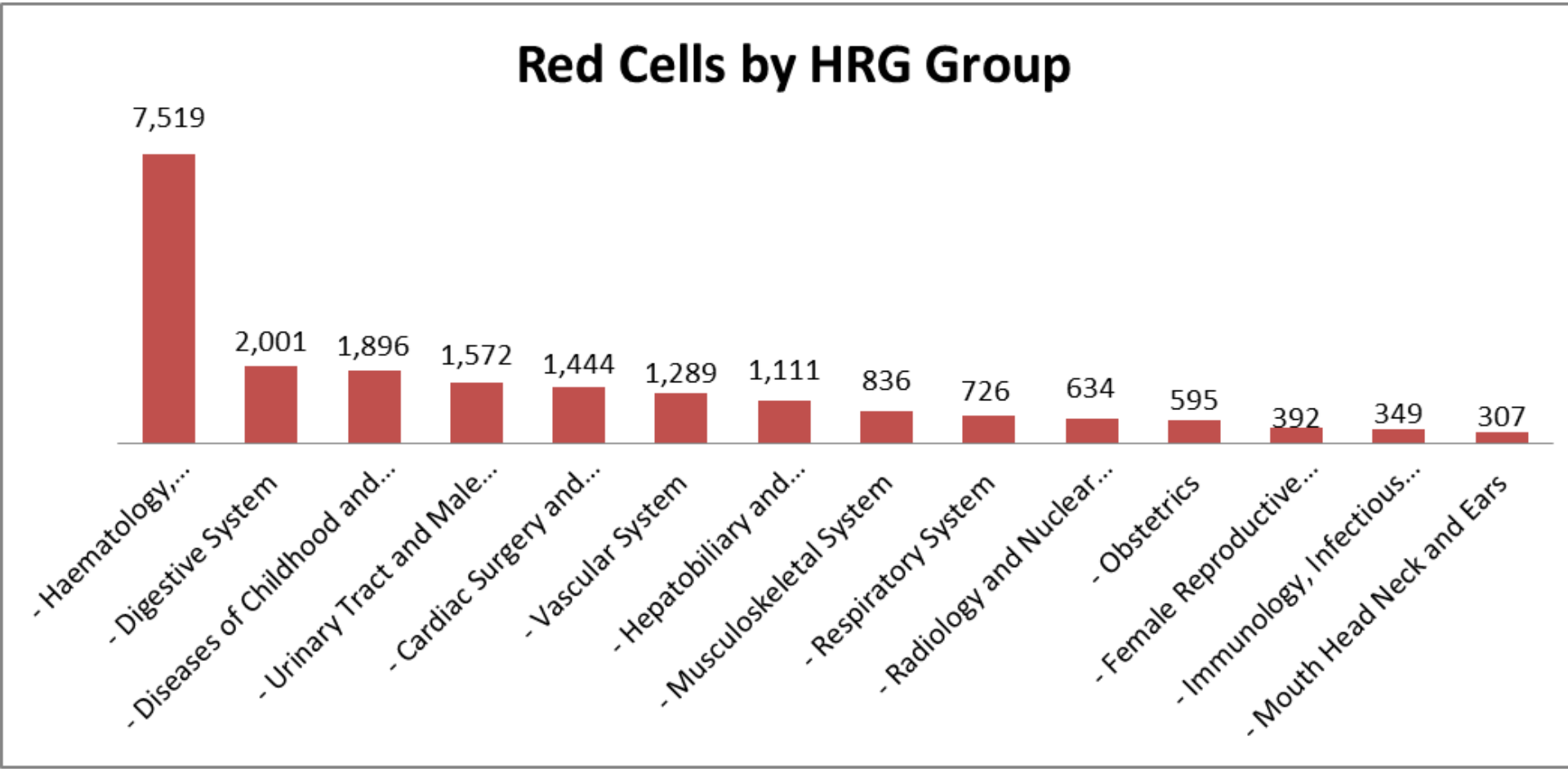


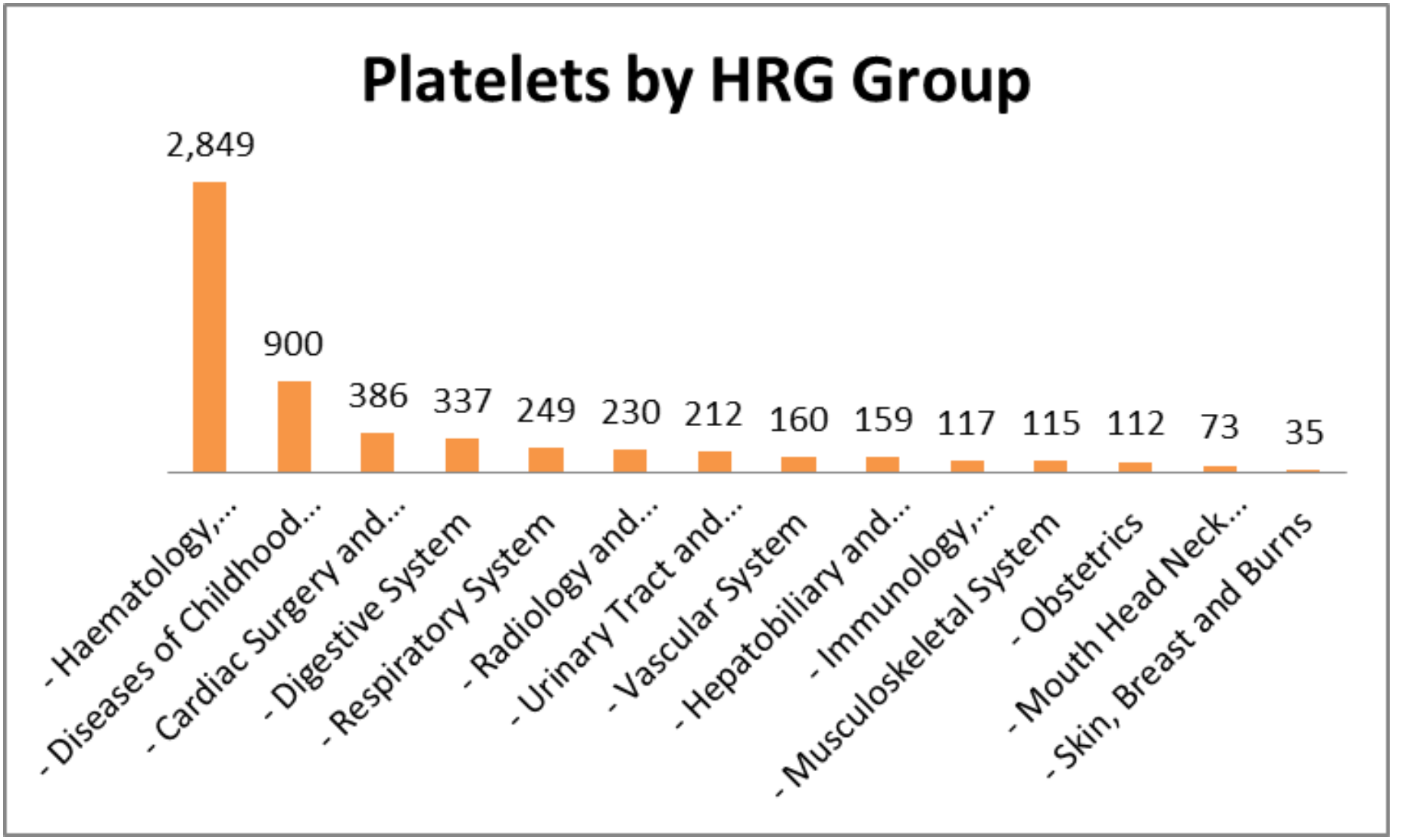
Use of Tranexamic Acid during surgery for key procedures



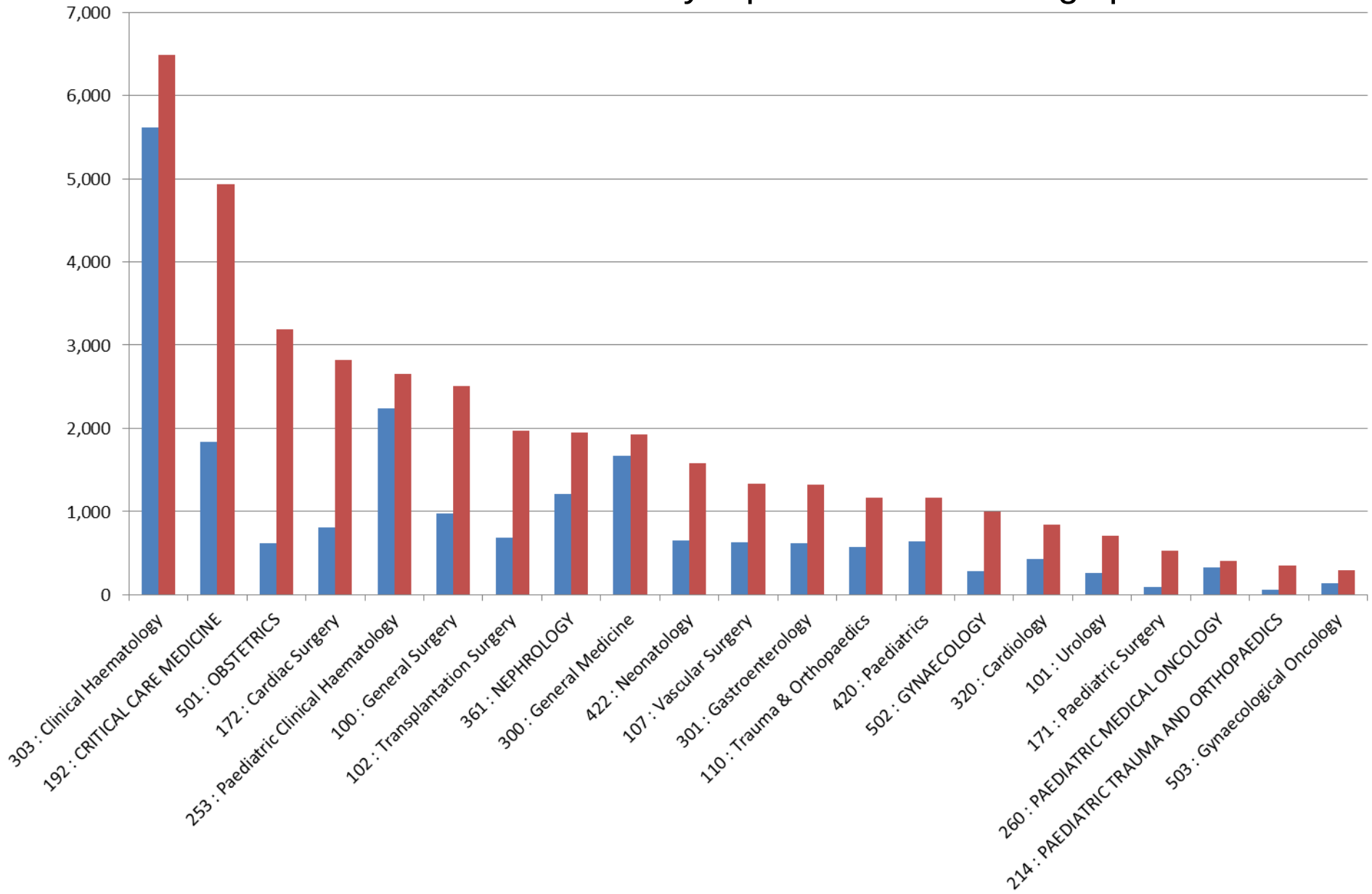

% of Red cell transfusions to patient by HRG chapter and Hb Result
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
5. >=100
4. 90 - <100
3. 80 - <90
2. 70-<80
1. <70
A - Nervous System
B - Eyes and Periorbita
C - Mouth Head Neck and Ears
D - Respiratory System
E - Cardiac Surgery and Primary Cardiac Conditions
F - Digestive System
G - Hepatobiliary and Pancreatic System
H - Musculoskeletal System
J - Skin, Breast and Burns
K - Endocrine and Metabolic System
L - Urinary Tract and Male Reproductive System
M - Female Reproductive System and Assisted Reprod...
N - Obstetrics
P - Diseases of Childhood and Neonates
Q - Vascular System
R - Radiology and Nuclear Medicine
S - Haematology, Chemotherapy, Radiotherapy and Spe...
U - Undefined Groups
V - Multiple Trauma, Emergency Medicine and Rehabili...
W - Immunology, Infectious Diseases and other contac...
NULL
28 15 22 56 12
5 7 6 6 4
35 32 62 80 43
66 87 187 258 87
258 221 328 289 77
192 210 296 366 178
93 91 122 163 98
70 75 101 128 57
45 43 32 37 21
4 11 21 29 12
137 178 381 439 204
46 28 64 87 37
54 75 114 170 80
226 213 213 571 220
158 185 266 197 81
41 44 99 135 41
340 381 668 1044 343
73 72 109 129 60
35 21 34 42 14
49 52 91 158 73
91 109 158 220 124


% transfusions given to patients with Hb < 80
% transfusions
60%
55%
50%
45%
40%
35%
30%
201501
201502
201503
201504
201505
201506
201507
201508
201509
201510
201511
201512
201601
201602
201603
201604
201605
201606

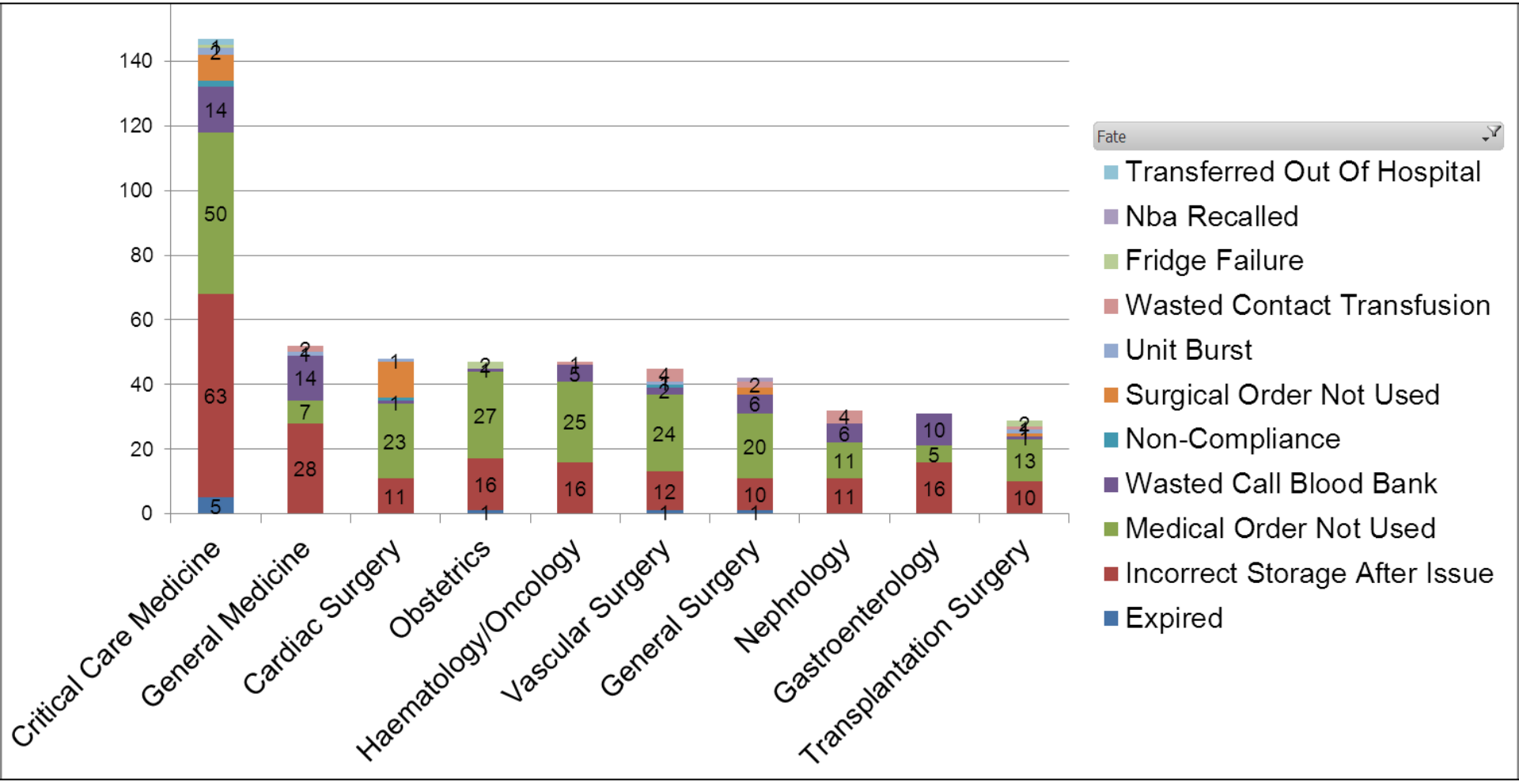

Red Cells by HRG Group
7,519
2,001
1,896
1,572
1,444
1,289
1,111
836
726
634
595
392
349
307
- Haematology,...
- Digestive System
- Diseases of Childhood and...
- Urinary Tract and Male...
- Cardiac Surgery and...
- Vascular System
- Hepatobiliary and...
- Musculoskeletal System
- Respiratory System
- Radiology and Nuclear...
- Obstetrics
- Female Reproductive...
- Immunology, Infectious...
- Mouth Head Neck and Ears


Platelets by HRG Group
2,849
900
386
337
249
230
212
160
159
117
115
112
73
35
- Haematology,...
- Diseases of Childhood...
- Cardiac Surgery and...
- Digestive System
- Respiratory System
- Radiology and...
- Urinary Tract and...
- Vascular System
- Hepatobiliary and...
- Immunology,...
- Musculoskeletal System
- Obstetrics
- Mouth Head Neck...
- Skin, Breast and Burns

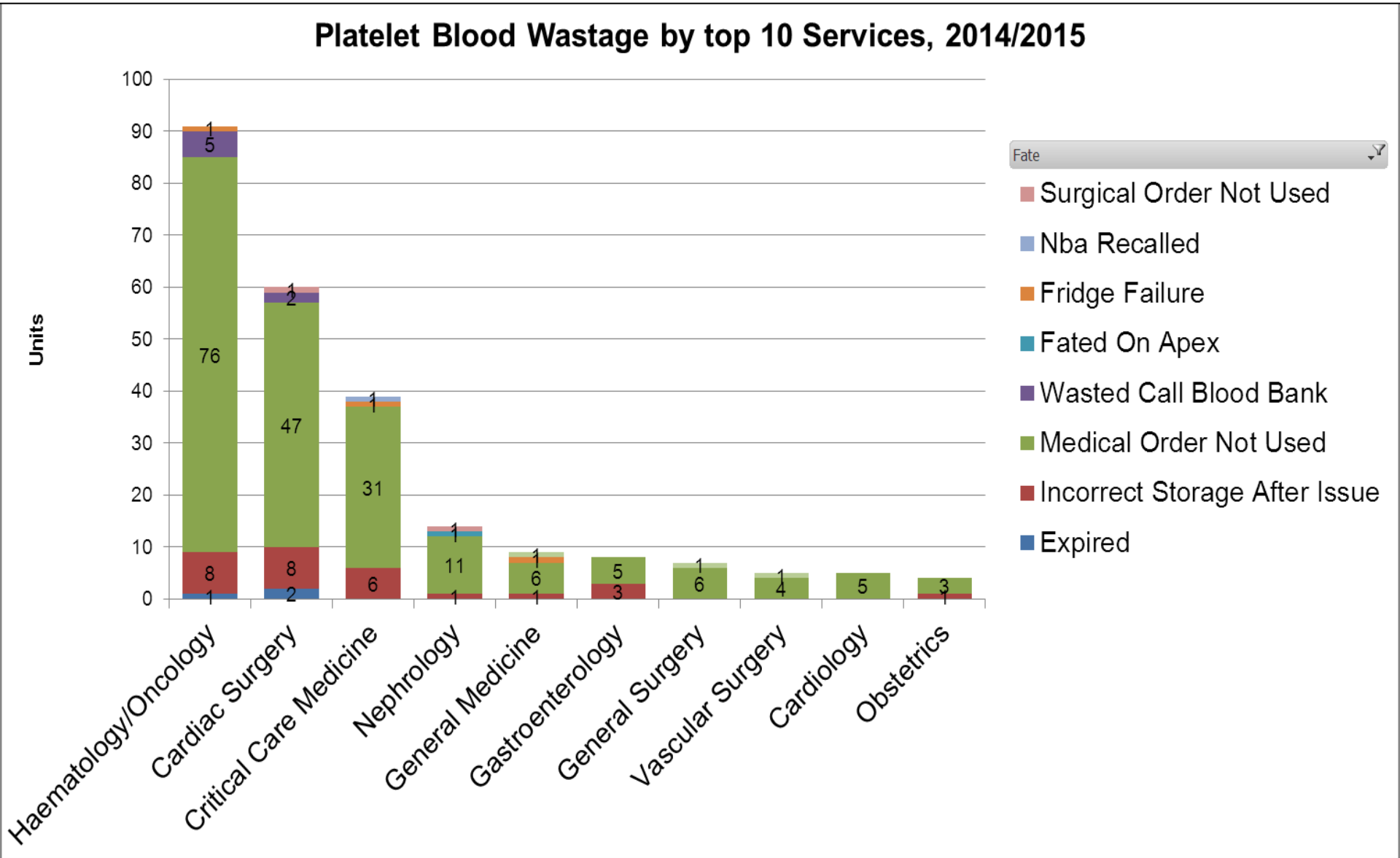
Red cells ordered and transfused by top 21 blood ordering specialties

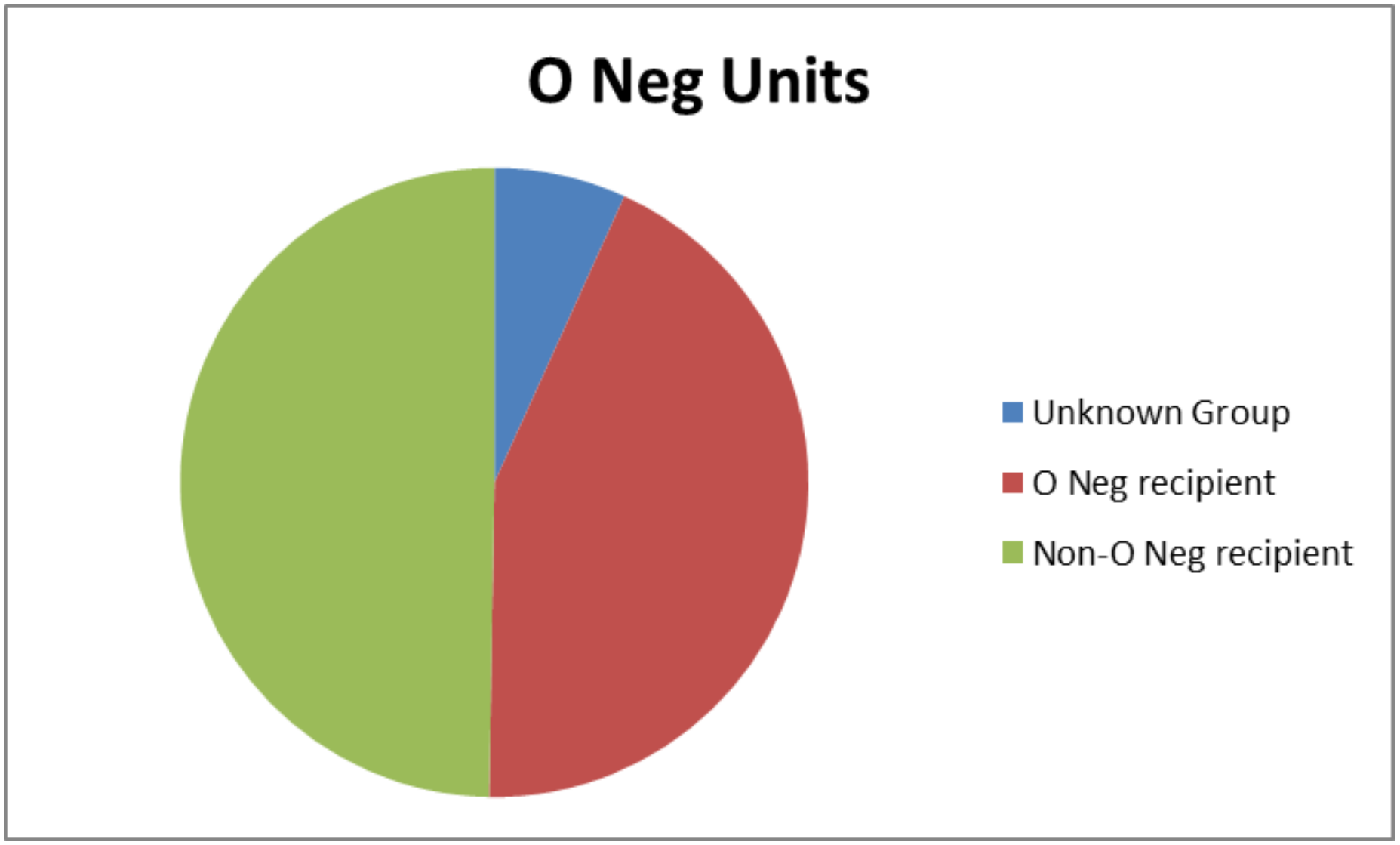


Red Cell Wastage by top 10 services



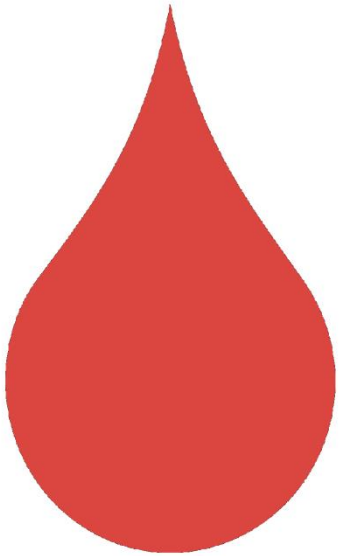
Platelet Wastage by top 10 services




O Neg Units
Unknown Group
O Neg recipient
Non-O Neg recipient

NHS

National Blood Transfusion Committee



Indication Codes for Transfusion

Red Cell Concentrates

Dose - in the absence of active bleeding, use the minimum number of units required to achieve a target Hb. Consider the size of the patient; assume an increment of 10g/L per unit for an average 70 kg adult.

R1 Acute Bleeding
Acute blood loss with haemodynamic instability.
After normovolaemia has been achieved/maintained, frequent measurement of Hb (including by near patient testing) should be used to guide the use of red cell transfusion – see suggested thresholds below.

R2 Hb < 70g/L stable patient
Acute anaemia.
Use an Hb threshold of 70g/L and a target Hb of 70-90g/L to guide red cell transfusion. Follow local/ specific protocols for indications such as post cardiac surgery, traumatic brain injury, acute cerebral ischaemia.

R3 Hb < 80g/L if cardiovascular disease
Use an Hb threshold of 80g/L and a target Hb of 80-100g/L.

R4 Chronic transfusion dependent anaemia
Transfuse to maintain an Hb which prevents symptoms.
Suggest an Hb threshold of 80g/L initially and adjust as required. Haemoglobinopathy patients require individualised Hb thresholds depending on age and diagnosis.

R5 Radiotherapy maintain Hb > 110g/L
There is limited evidence for maintaining an Hb of 110g/L in patients receiving radiotherapy for cervical and possibly other tumours.

Guidance for the use of Blood Components
NBTC Indication Codes for Transfusion (June 2016)

PRC | FFP | Plts | Cryo | PCC

Fresh frozen plasma

Dose - 15 ml/kg body weight, often equivalent to 4 units in adults.

F1 Major haemorrhage
Early infusion of FFP is recommended in a ratio of 1 unit FFP:1 unit red cells for trauma and at least 1 unit FFP: 2 units red cells in other major haemorrhage settings. Once bleeding is under control, FFP use should be guided by timely tests for coagulation as indicated below.

F2 PT Ratio / INR >1.5 with bleeding
Clinically significant bleeding without major haemorrhage. FFP required if coagulopathy. Aim for a PT and APTT ratio of ≤1.5.

F3 PT Ratio / INR >1.5 and pre-procedure
Prophylactic use when coagulation results are abnormal e.g. disseminated intravascular coagulation and invasive procedure is planned with risk of clinically significant bleeding.

F4 Liver disease with PT Ratio/INR >2 and pre-procedure
FFP should not be routinely administered to non-bleeding patients or before invasive procedures when the PT ratio/ INR is ≤2.

F5 TTP / plasma exchange.

F6 Replacement of single coagulation factor.

Pause before you POD!!!

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Reject Me Not

Before you send a sample to the lab, take a moment to work through this and make sure your patient's sample is not rejected:

- **Re-check** You can read all the details
- **Examine** The tube is clean
- **Justified** My patient needs this test
- **Enough** Adequate sample for the test
- **Clots** No haemolysis, gentle invert to mix
- **Tubes** I have the right tube, and it's the right size
- **Matches** I have the right patient at the right time
- **Emergency** Clearly identified for the laboratory
- **Name** I am taking responsibility
- **Outcome** Own this decision
- **Time** Transport or reject

Working together, our aim is to

- **Reduce inappropriate testing**
- **Reduce delays in treatment and care**
- **Reduce time wasted on sample rejections**

Contact: Marie Green, Lead Transfusion Practitioner for Patient Blood Management marie.green@cmft.nhs.uk

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Conclusions

- There is a wealth of data in hospital systems to support the implementation of patient blood management
- You need engagement with your hospital informatics team
- Provide bespoke information for different clinical areas
- Aim for national standards for transfusion request specification, decision support and PBM performance indicators
- Aim for clinical benchmarking