Transfusion Errors in Transplant Recipients

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Serious Hazards of Transfusion

Transfusion risks in transplantation

- Patients receiving transplants, solid organ or haemopoietic stem cell transplants (HSCT) need careful attention in provision of blood component support, especially when donor and recipient are ABO or D nonidentical

Serious Hazards of Transfusion

- UK national haemovigilance scheme
- 19 years
- Adverse incidents and near miss events related to transfusion of blood and blood components
- About 3500 reports each year

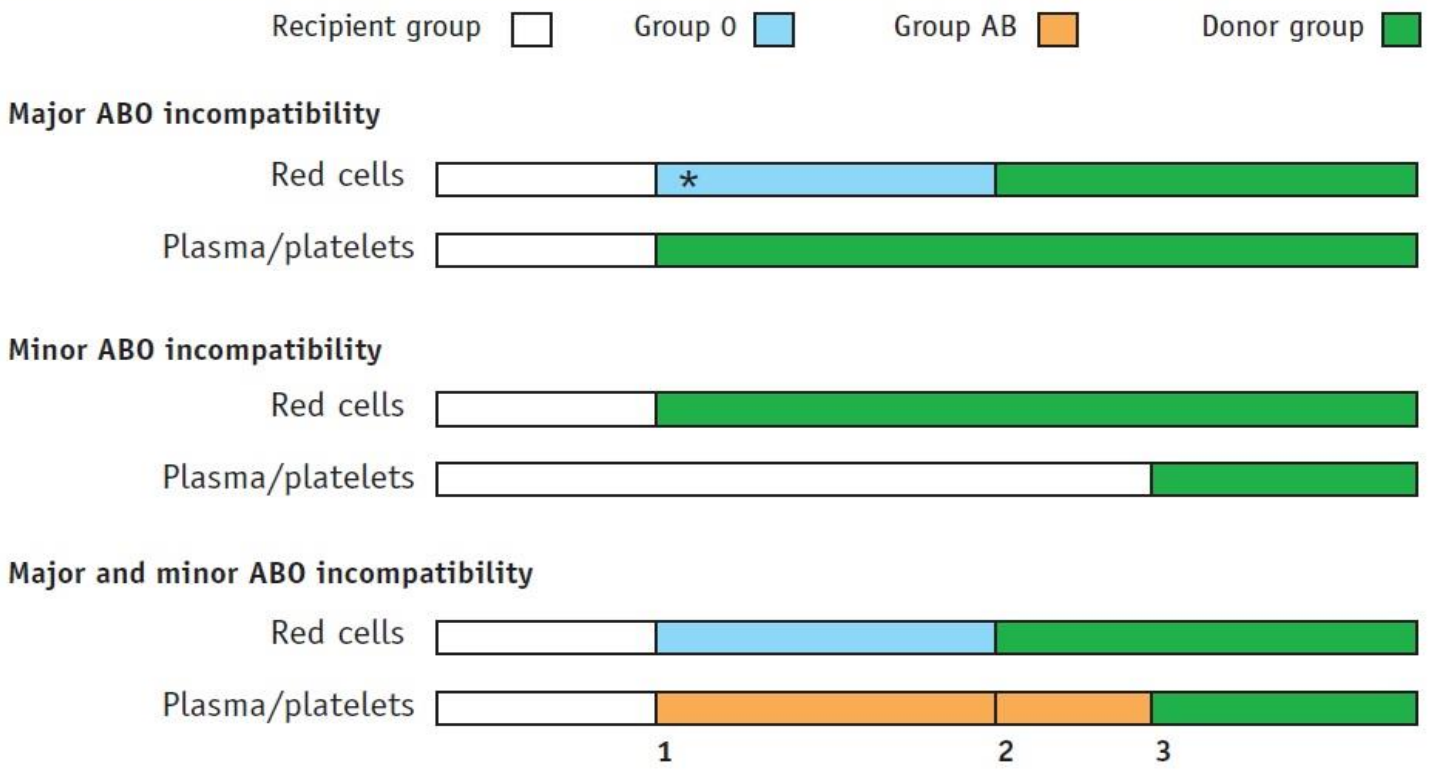
Haemovigilance data

- An analysis was undertaken of 6 years of SHOT incident reports that related to transfusion of patients undergoing transplantation
- 2010-2015

Compatibility of ABO groups

Major	Minor	Major plus minor
Recipient plasma contains antibodies which react with donor red cells	Presence of antibodies in donor plasma which react with recipient red cells	Bidirectional incompatibility
Donor group A, recipient group O	Donor group O, recipient group A	Donor group A recipient group B

Figure 1: **Strategy for the provision of blood components in ABO mismatched HSCT**

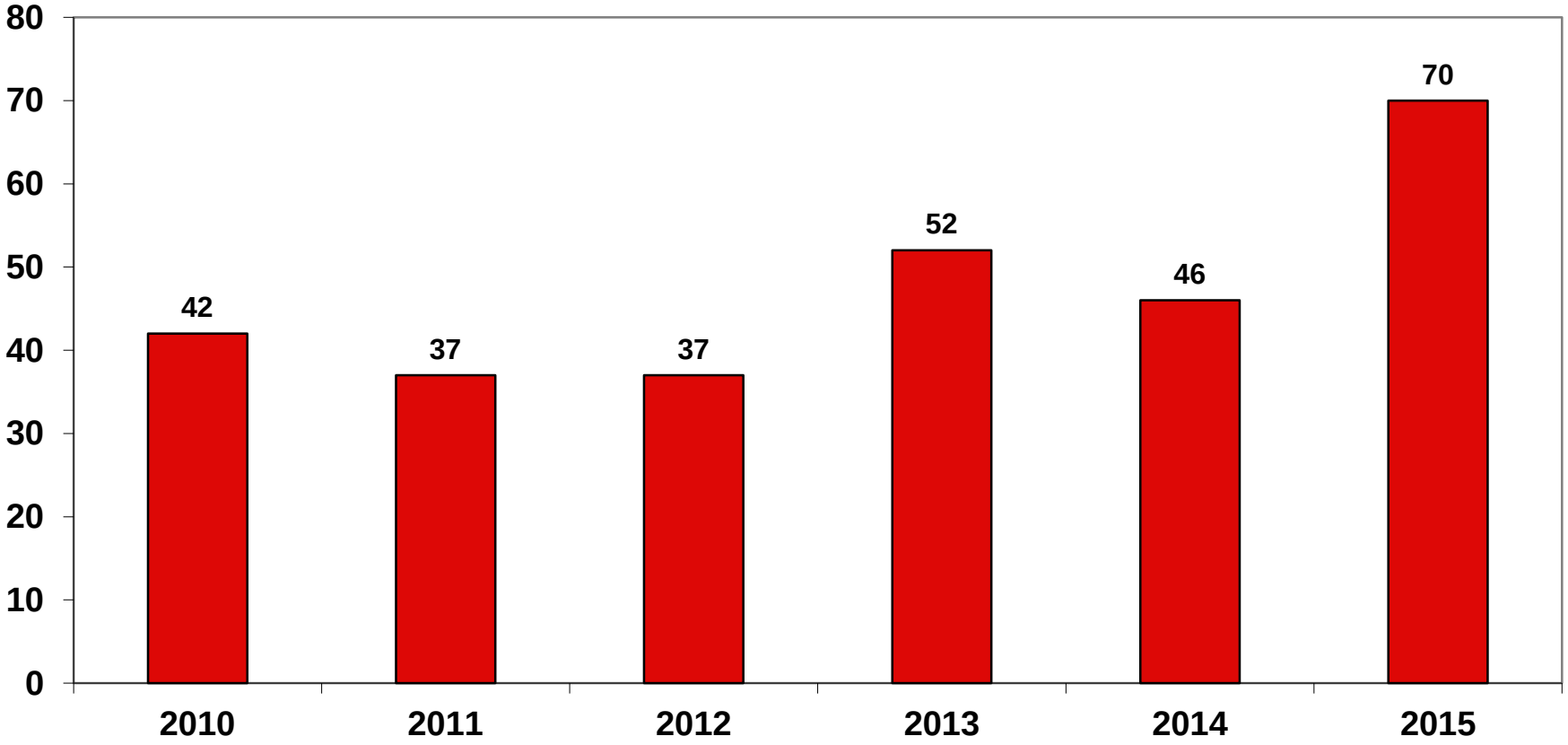


1 HSCT
2 ABO antibodies to donor RBC not detected. Direct antiglobulin test negative
3 RBC of recipient group no longer detected

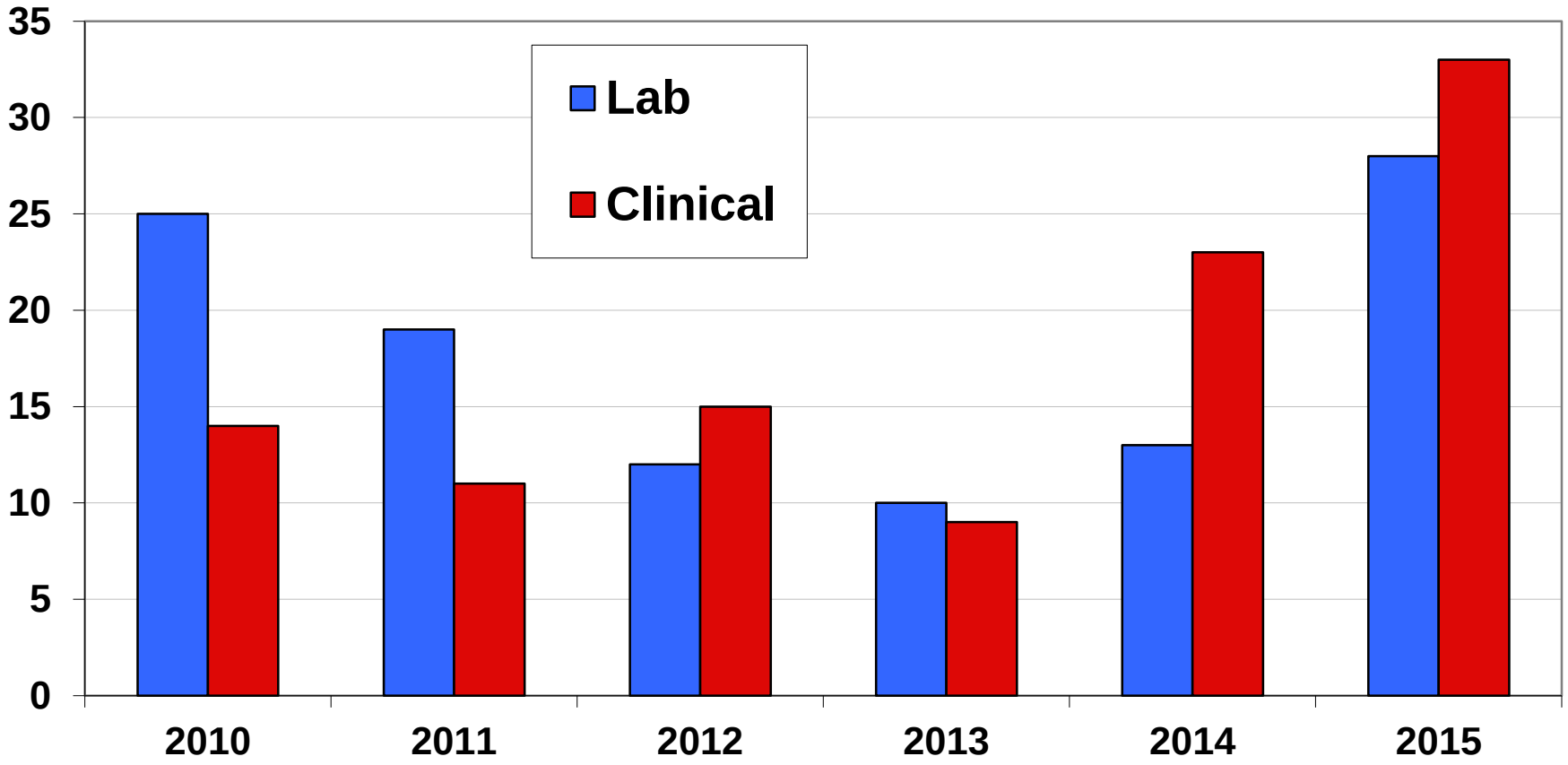
**Or recipient-type red cells. Modified from Practical Transfusion Medicine with permission (Figure 27.3, page 138). Practical Transfusion Medicine (Third Edition) Murphy MF, Pamphilon D, Wiley-Blackwell Publishers 2009; 138*

Total transplant errors 2010-2015 n=284

212 HSCT, 72 Solid organ

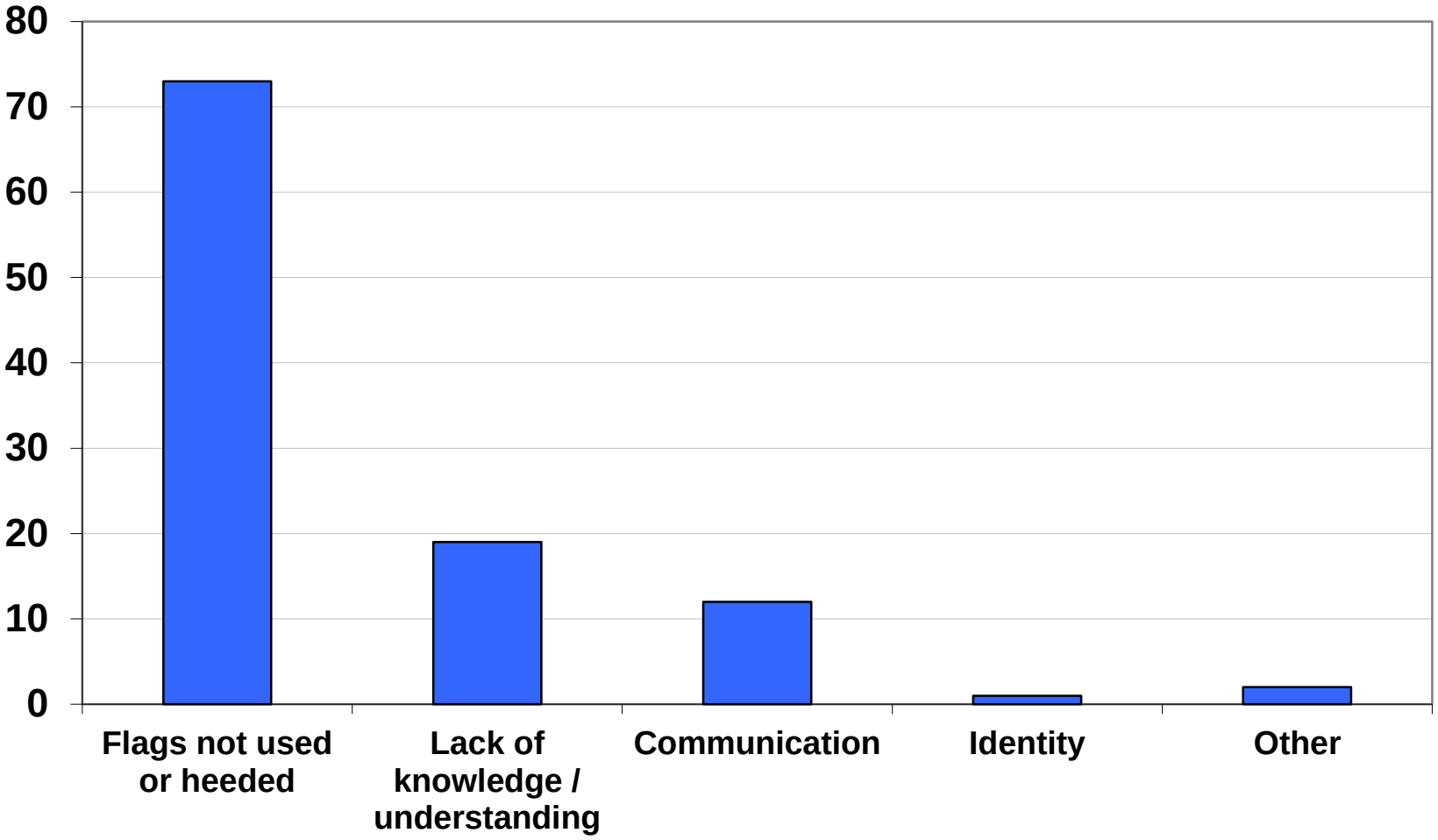


Number of HSCT errors by year



Source of primary error, made in the laboratory or in the clinical area

Types of laboratory error

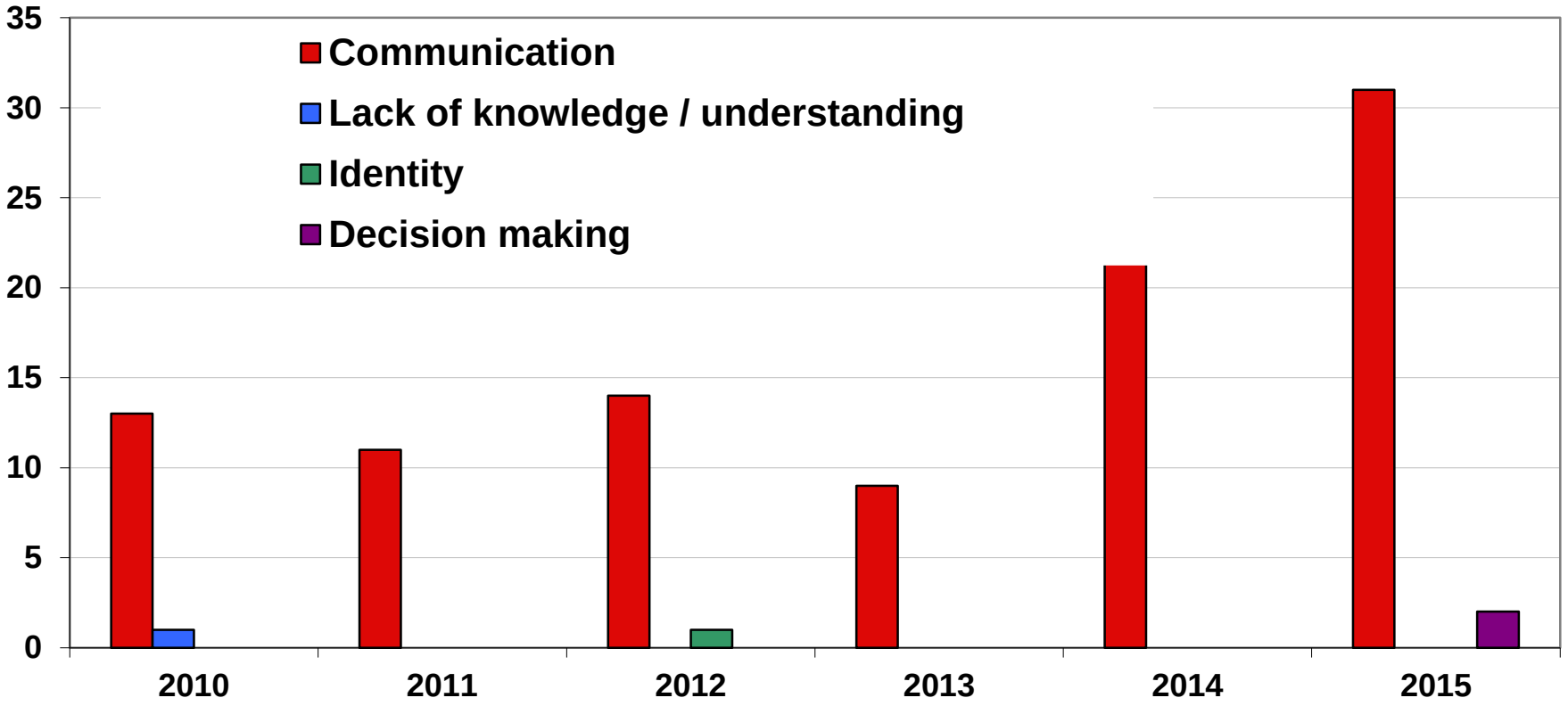


'Flags' means patient warnings added to the laboratory information system

Potential HSCT donor group mistakenly entered into the recipient's record in the lab

- Group B D-positive had been entered into the patient's record, but the current specimen from the patient (5 days later) was found to be A D-positive
- Investigation identified a transcription error: the original specimen was from the planned HSCT donor for the patient
- This was grouped as B D-positive and entered against the patient's record and not the donor's
- Both donor and recipient groups were checked on new samples

Types of clinical error



Mislabelling of sample

- Two patients, one for a stem cell harvest Mr A, and the other a lymphocyte donor, Mr B were in same bay
- Specialist nurse rushing to complete both procedures and chatting to both
- Labelled Mr B's blood group sample with Mr A's details away from bedside
- Detected in lab because of discrepancy with previous record of blood group

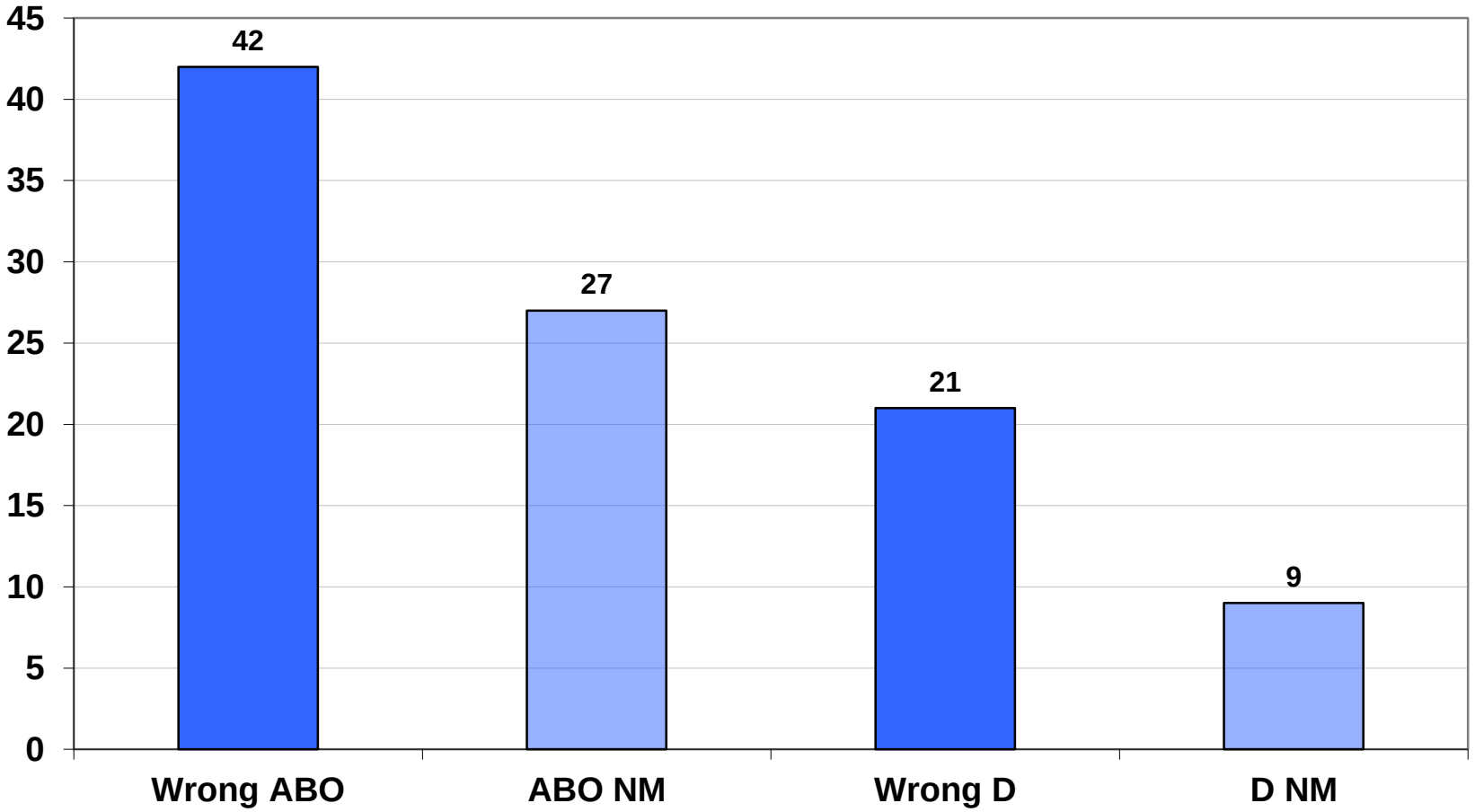
What were the errors in HSCT?

Classification of errors	No.
Specific requirements not met	62
Incorrect ABO group given (12 platelets)	52
Incorrect D group given	21
Near misses, error discovered before transfusion	74
Other	3
Total	**212**

Haemolytic transfusion reaction

- A 48 year old woman with AML, originally blood group A, received allograft from donor of blood group O
- 10 days post transplant she received 4 units of group A and developed intravascular haemolysis with jaundice
- The laboratory system had not been updated with transplant information

HSCT data 2010-2015



NM = near miss

Reasons

Causes of errors	No.
Poor communication	113
Flags on laboratory information management system (LIMS) not updated or heeded	73
Lack of knowledge	20
Other	6
Total	**212**

Surprisingly poor communication

- Lack of communication n=113/212 (53.3%),
- Between the clinical team and the transfusion laboratory
- Between different clinical teams for patients receiving shared care between the transplant centre and their local hospital
- 53 cases with failure to inform the laboratory that a HSCT was taking place with ABO group change

Incorrect ABO blood group transfused due to lack of communication

- A staff nurse noticed a patient was being transfused with group A red cells, but knew the patient had received HSCT from his sister (blood group O) 7 days previously
- The staff nurse contacted the transfusion laboratory, but there was no indication on the laboratory information management system that the patient had received an ABO-incompatible transplant
- The BMS confirmed that group O units should have been issued to the patient and the transfusion was stopped when the patient was receiving the second unit of group A red cells

Near miss transfusion of incompatible blood

- 2 units of blood requested following HSCT
- Shared care plan stated AB D-pos red cells to be given
- Ward staff collected unit but informed lab staff that the patient was having chemotherapy
- The transplant had failed, and the patient required his original group, A D-neg but the laboratory had not been informed

Unacceptable failing

- A patient was incidentally noted at a laboratory meeting to have had an allo HSCT
- No information had been supplied about ABO group change or specific requirements
- 2nd case identified within a month (mixed field reaction)
- Subsequent retrospective review (8 month period) found 17 HSCT had taken place that were not known to the laboratory

Poor communication puts patients at risk

- 6/17 HSCT were allografts
- 4/6 had received incorrect blood group components issued by electronic issue and not IAT crossmatch
- Fortunately only 1 received incompatible components but had no reaction (B D-pos recipient, A D-neg stem cell donor)

Root cause analysis

- The transplant unit had moved in 2014 with some changes in team structure
- Turnover of staff, 5 temporary BMT administrators and 4 different doctors as BMT co-ordinators, so lack of continuity
- Failure to complete procedures correctly in several different ways: a complete breakdown in established protocols

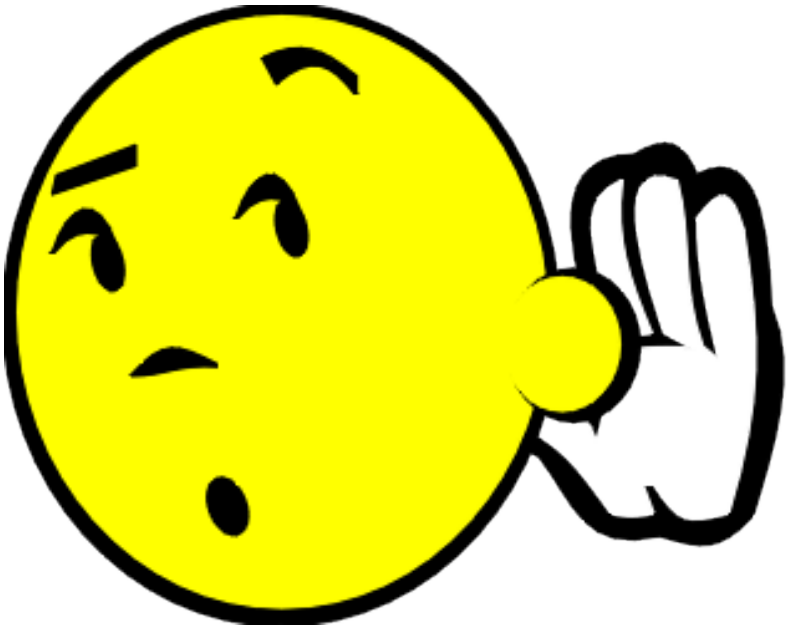
Alloimmunisation after D-mismatched solid organ transplant

- A 13 year old girl, group B D-negative, developed anti-D following liver transplant from a live donor whose group was O D-positive
- Anti-D immunoglobulin prophylaxis was not given
- Anti-D antibodies were detected 11 weeks later
- The transplant unit did not have a policy for this
- Cadaveric livers are washed out prior to transplant but live ones are not

Learning point

Anti-D immunoglobulin prophylaxis is not always given to D-negative females of childbearing potential who receive D-positive solid organ transplants. This is especially important when organs are from living donors.

Communication, communication…



SHOT recommendations 2012

- A written transplant programme detailing key dates and blood group information
- Send to lab with confirmation of receipt
- Ensure any shared care hospital including its laboratory is informed
- Guidelines should be developed to cover communication procedures

SHOT Symposium 2017

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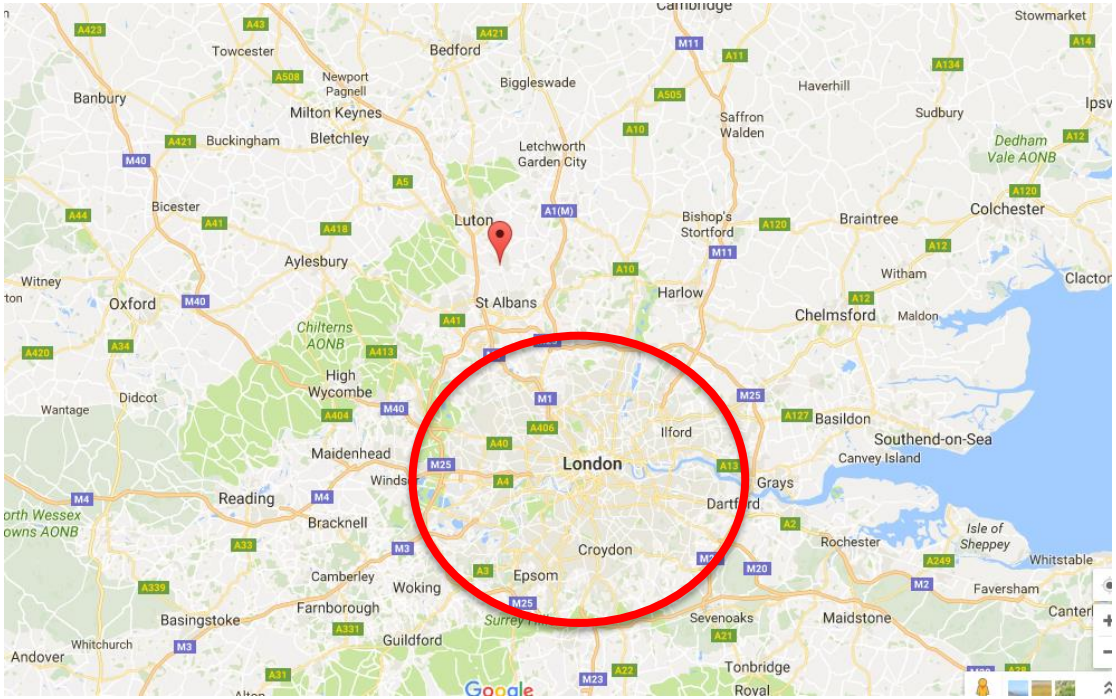
Rothamsted Centre for Research and Enterprise, Harpenden, Hertfordshire AL5 2JQ



Acknowledgements

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Many resources on website
www.shotuk.org