# SHOT Serious Hazards of Transfusion

# ANNUAL SHOT REPORT 2020 SUMMARY

## Key recommendations

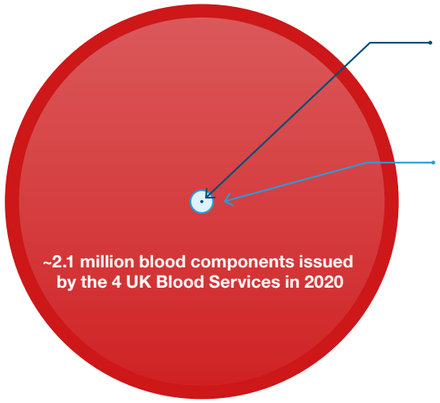
Transfusion delays, particularly in major haemorrhage and major trauma situations, must be prevented. Delays in provision and administration of blood components including delays in anticoagulation reversal, particularly in patients with intracranial haemorrhage, can result in death, or serious sequelae. Every minute counts in these situations

Effective and reliable transfusion information technology systems should be implemented to reduce the risk of errors at all steps in the transfusion pathway, provided they are configured and used correctly

Effective investigation of all incidents and near miss events, application of effective corrective and preventive actions, and closing the loop by measuring the effectiveness of interventions should be carried out to optimise learning from incidents

### Risk of death and serious harm relating to transfusions in the UK in 2020

Transfusion in the UK remain very safe with low risk of harm in relation to the number of blood components issued.




The risk of death related to transfusion in the UK is 1 in 53,193 components issued

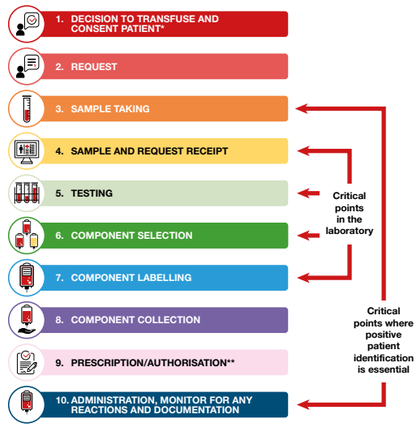
The risk of serious harm related to transfusion in the UK is 1 in 15,142 components issued

The risks of transfusion-transmitted infection are much lower than all other transfusion-related complications

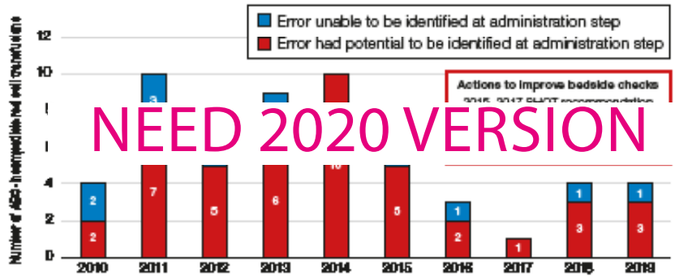
Note: This is a representative image and not accurate to scale

### The 10 steps in transfusion pathway

The transfusion pathway has been updated to 10 steps to include the decision to transfuse and patient consent




### Most ABO-incompatible red cell transfusions could have been detected at the pre-administration checks, emphasising the importance of using this check




*DH=Department of Health; CAS=central alerting system*

### ABO-incompatible transfusions 2016-2020: few events (n=19) but many near misses (n=1495)


### TACO pre-transfusion checklist

*TACO=transfusion-associated circularly overload*

| TACO Checklist | Patient Risk Assessment | YES | NO |
|---|---|---|---|
| | Does the patient have any of the following: diagnosis of 'heart failure', congestive cardiac failure (CCF), severe aortic stenosis, or moderate to severe left ventricular dysfunction? | | |
| | Is the patient on a regular diuretic? | | |
| | Does the patient have severe anaemia? | | |
| | Is the patient known to have pulmonary oedema? | | |
| | Does the patient have respiratory symptoms of undiagnosed cause? | | |
| | Is the fluid balance clinically significantly positive? | | |
| | Is the patient receiving intravenous fluids (or received them in the previous 24 hours)? | | |
| | Is there any peripheral oedema? | | |
| | Does the patient have hypoalbuminaemia? | | |
| | Does the patient have significant renal impairment? | | |

| If Risks Identified | YES | NO |
|---|---|---|
| Review the need for transfusion (do the benefits outweigh the risks)? | | |
| Can the transfusion be safely deferred until the issue can be investigated, treated or resolved? | | |

| If Proceeding with Transfusion: Assign Actions | TICK |
|---|---|
| Body weight dosing for red cells | |
| Transfuse a single unit (red cells) and review symptoms | |
| Measure fluid balance | |
| Prophylactic diuretic prescribed | |
| Monitor vital signs closely, including oxygen saturation | |

| | | |
|---|---|---|
| Name (PRINT): | | Due to the differences in adult and neonatal physiology, babies may have a different risk for TACO.<br><br>Calculate the dose by weight and observe the notes above. |
| Role: | | |
| Date: | Time (24hr): | |
| Signature: | | |


**CONTACT DETAILS**
SHOT Office, Manchester Blood Centre,
Plymouth Grove, Manchester, M13 9LL
Tel: +44 (0) 161 423 4208
Enquiries: shot@nhsbt.nhs.uk
www.shotuk.org

### Paediatric SHOT summary from 2020

- Paediatric reports accounted for 8.5% (159/1877) of the total cases reported to SHOT in 2020
- There were 3 deaths possibly or probably related to transfusion-associated necrositising enterocolotis and 2 were related to transfusion delays
- Massive blood loss in children is less common than in adults and hospitals should have protocols in place for appropriate and timely management
- Communication and education regarding specific requirements and their indications remains vital
- Management of D-incompatible platelet transfusions in neonates and children should be discussed with a haematologist
- Education and training resources should be provided for those administering neonatal transfusions to reduce errors

### To ensure safe transfusions in patients with haemoglobin disorders the following aspects need to be addressed

Processes should be in place to ensure a detailed transfusion history should be obtained in all sickle cell disease (SCD) patients requiring transfusion. It is important that the transfusion history of a patient including antibody status is communicated between clinical and laboratory teams, including any specialist tests from reference laboratories (Davis et al. 2016)

Individual transfusion decisions in SCD patients can be challenging, and advice from haemoglobinopathy specialists is recommended

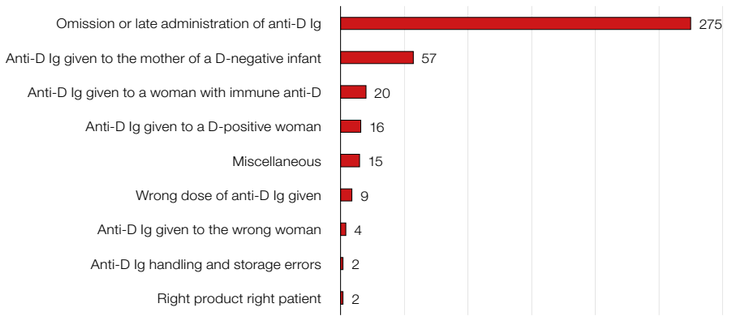
For patients with complex transfusion requirements a multidisciplinary approach is recommended with representation from haemoglobinopathy and transfusion medicine specialists. Where possible a transfusion plan should be agreed in advance of an anticipated transfusion

### JL signature

There were 25 reports of avoidable use of O D-negative red cells; 9 were associated with major haemorrhage activations. O D-negative red cells are a precious resource with limited supply. Approprate transfusion decisions will avoid unncessary use of these valuable components

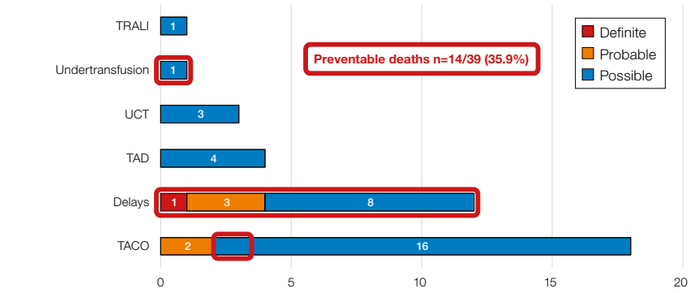
## Distribution of anti-D Ig related error reports in 2020 n=400

Anti-D Ig errors can result in sensitisation to the D antigen and can cause haemolytic disease of the fetus and newborn



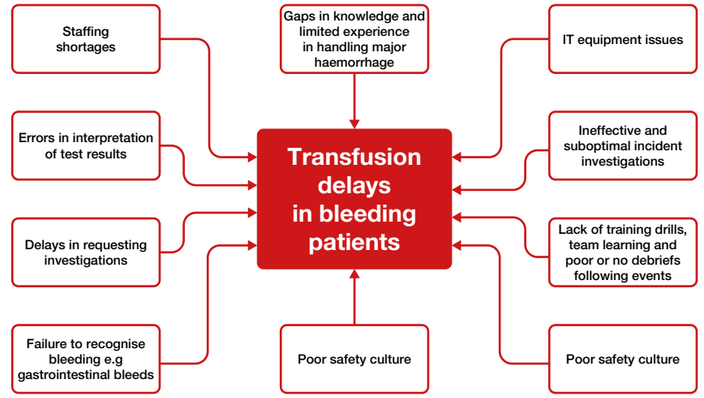

## Deaths related to transfusion (with imputability) reported in 2020 n=39

There were 39 transfusion-related deaths in 2020. Of these, 14 could have been prevented.

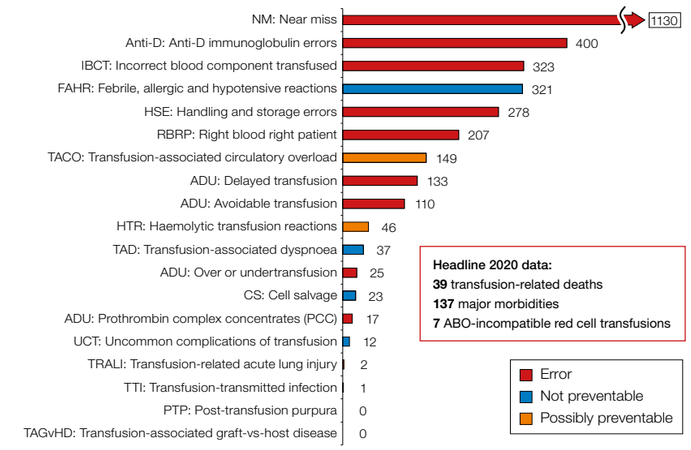



*TTI=transfusion-transmitted infections; TAD=transfusion-associated dyspnoea; PCC=prothrombin complex concentrate; UCT=uncommon complications of transfusion; TACO=transfusion-associated circulatory overload*

## Factors contributing to transfusion delays in bleeding patients

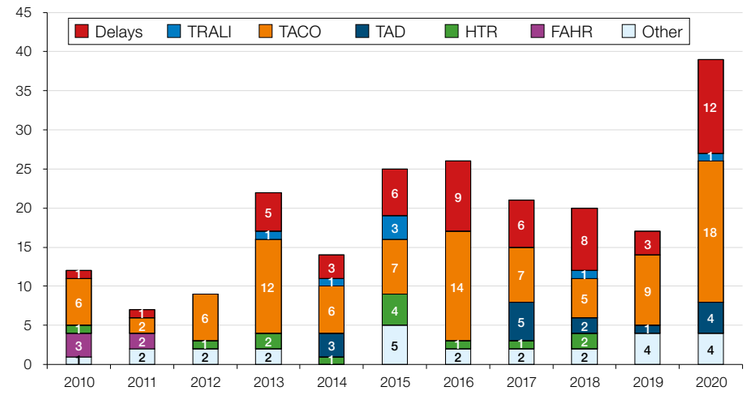



## Summary data for 2020, all categories (includes RBRP and NM) n=3214




## Transfusion-related deaths 2010 to 2020 n=173

TACO and delays are the most prevalent causes of transfusion-related deaths year on year.




*TRALI=transfusion-related acute lung injury; TACO=transfusion-associated circulatory overload; TAD=transfusion-associated dyspnoea; HTR=haemolytic transfusion reaction; FAHR=febrile, allergic and hypotensive reaction*
*Delays include 1 delay due to PCC in 2019; HTR includes 2 deaths due to ABO-incompatibility; 'Other' includes 1 each for post-transfusion purpura, transfusion-associated graft-versus-host disease (2012) and anti-D related; there were 7 in the avoidable, over or undertransfusion category, 3 transfusion-transmitted infections, and 9 deaths related to other unclassified reactions*

## Key laboratory messages

Trust/Health Board governance should review staffing levels in transfusion laboratories and ensure the skill mix is in compliance with UK Transfusion Laboratory Collaborative (UKTLC) standards and that there are sufficient numbers of staff in line with capacity plan (UKTLC 2014)

Transfusion laboratories should have clear procedures for component selection to avoid ABO-incompatible transfusion. Complex situations should be discussed with a haematologist or UK Blood Transfusion Service (UKBTS) consultant for concessionary issue where time allows

Handover is a safety critical point in the working day. Transfusion laboratories should implement a written handover log to support clear communication

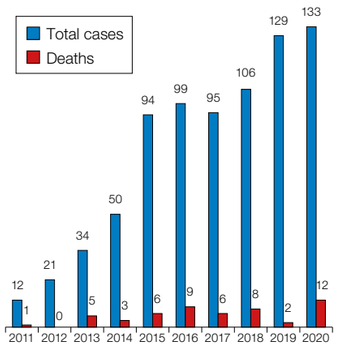
K-negative units should be provided to K-negative individuals of childbearing potential. Failure to do so puts future pregnancies at risk. Laboratory information management systems (LIMS) rules, which cannot be easily overridden, should be implemented to aid this process

If in doubt, ask the right person for the right advice. SOP should include sufficient information and escalation procedures; however, it is in the interest of patient safety to check details of procedures with senior colleagues rather than assume

## Errors continue to account for most reports in 2020 - 2623/3214 (81.6%)

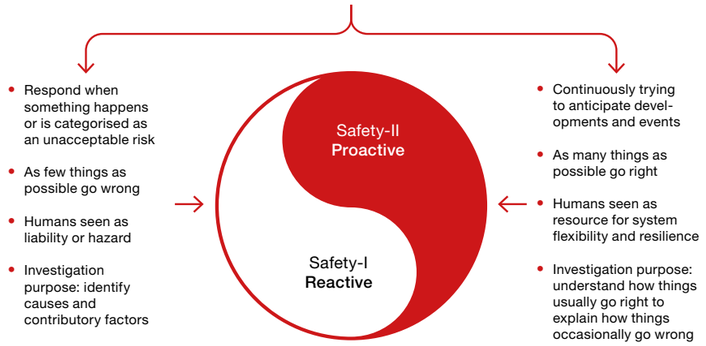

2623 Errors (all preventable)
394 Not preventable
197 Possibly preventable

## Transfusions delays and deaths due to delays reported to SHOT 2011 - 2020 (n=775, deaths = 53)




## Combining Safety-I and Safety-II approaches can help to understand the reasons for errors and improve patient safety

To improve patient safety, a combined approach using both Safety-I and Safety-II principles is essential




## The A-E decision tree to facilitate decision making in transfusion

**A** Assess patient
Any avoidable blood loss
(frequent, unnecessary tests/interventions)

**B** Blood results (all) reviewed including trends – valid and reliable?
Best treatment option—is transfusion the best treatment option? If yes, what components needed, how many, what order and any specific requirements needed?

**C** Consent/communication (adequate patient information—both verbal and written) to patients and where appropriate to families and carers
Correctable factors to be addressed like bleeding, haematinic deficiency

**D** Do not forget other measures (vitamin K, tranexamic acid, cell salvage, etc)
Do not hesitate to question colleagues regarding decisions made and ask for rationale
Do not forget to document in patient's notes and in discharge summaries

**E** Ensure timely communications to laboratory- need to be clear, concise and accurate
Ensure all relevant transfusion checklists including TACO risk assessment and actions arising thereafter have been completed
Evidence based decisions made weighing risks, benefits and options available
Ensure patient receives adequate post-transfusion information if transfusion given as a day case